# PUBLIC HEALTH REPORTS

*In this issue*

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

a century of mental health

# St. Elizabeths Hospital

## 1855 - 1955

*See page ii*

HOSPITAL FOR THE INSANE OF THE ARMY AND NAVY AND THE DISTRICT OF COLUMBIA

*Volume 70 Number 2* **February 1955**

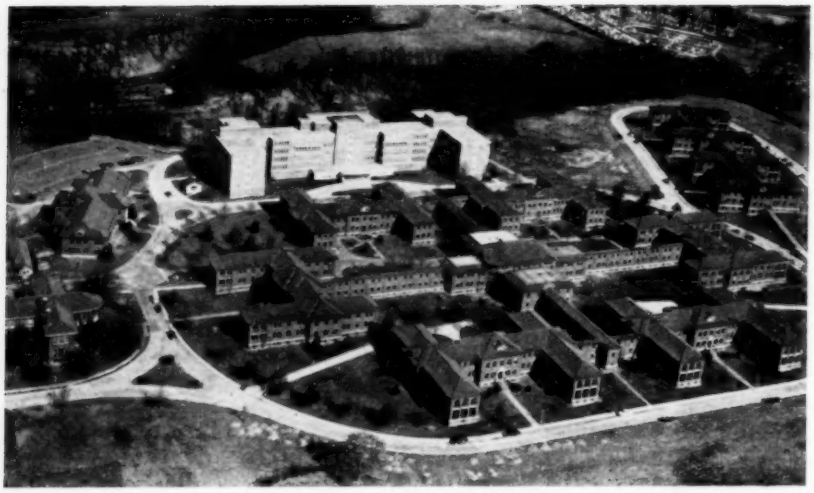
# PUBLIC HEALTH REPORTS

*Published since 1878*

## *Contents*



**Continued ▶**



Aerial view of St. Elizabeths grounds.

# St. Elizabeths Marks 100th Anniversary

St. Elizabeths Hospital in Washington, D. C., a part of the Department of Health, Education, and Welfare, marks its centennial this year.

Founded by the Congress in 1855, St. Elizabeths has grown from a set of plans which originally called for 90 beds to a community of more than 7,200 patients. Today, recognized internationally, its signal achievements include pioneer work in neuropathology, special treatment wards and special wards for legal offenders, introduction of hydrotherapy and of the use of Kraepelin's classification of mental disorders for diagnosis.

Some of the earliest American writing on forensic psychiatry started at St. Elizabeths, beginning with the work of Glueck and continuing through that of Karpman. Kempf's volume on psychopathology was written at the hospital. Several of Korzybski's early studies in semantics were made there. Its present superintendent, Dr. Winfred Overholser, is the author of "The Psychiatrist and the Law," published in 1953.

This spring, a new 400-bed treatment and admissions building, to be known as the Dorothea Lynde Dix Pavilion, will be dedicated. Miss Dix, chief nurse for the Union Army during the Civil War, was a dynamic reformer. Her efforts led to the establishment of St. Elizabeths, along with at least 30 State mental hospitals.

## frontispiece . . .

Top: Entrance to the geriatrics building—cornerstone laid in 1950. Center: Porte cochere, center building. This is the entrance to the original hospital. Bottom: An old lithograph shows St. Elizabeths in the early 1860's.

## *Contents for February, continued*

# PUBLIC HEALTH REPORTS



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OVETA CULP HOBBY, *Secretary*

PUBLIC HEALTH SERVICE
LEONARD A. SCHEELE, *Surgeon General*

# Utilization of Local Health Centers in 25 North Carolina Counties

By A. L. CHAPMAN, M.D., M.P.H., J. W. R. NORTON, M.D., M.P.H., and EDWARD E. SPRINGBORN, B.C.S.

HISTORICALLY, many local health departments have been poorly housed, frequently in the basements of county courthouses or city halls.

During World War II, under the provisions of the Lanham Act, modern health centers were built in various parts of the country near important military installations or defense plants. The passage of the Hospital Survey and Construction Act in 1946 made it possible for State hospital authorities to include participation in the construction of local health centers in their overall State hospital plan. Some States, among them North Carolina, have taken advantage of this opportunity and have participated in the construction of a significant number of modern local health centers. These centers have increased the stature of local health departments and have greatly improved the effectiveness and morale of the public health workers who use them.

Great care has been taken in planning and constructing these health centers. Their architectural and engineering features, with minor exceptions, reflect the high quality of architectural and engineering skills that contributed to their design and construction. It always is more difficult to modernize traditional public health programs than it is to adopt modern architectural designs in the construction of new health centers.

With this thought in mind, the authors queried a group of local health officers in North Carolina concerning certain phases of the programs that were being conducted in their local health centers. The staffs of the North Carolina State Board of Health and of the local health departments concerned cooperated in the study.

The sample selected consisted of 25 counties in which there had been erected local health centers with the aid of Federal, State, and local funds. These counties were:

| | | |
|---|---|---|
| Beaufort | Harnett | Rutherford |
| Burke | Hertford | Sampson |
| Caldwell | Martin | Scotland |
| Caswell | Moore | Stanly |
| Currituck | Northampton | Tyrrell |
| Dare | Person | Warren |
| Franklin | Robeson | Wilson |
| Edgecombe | Rockingham | |
| Halifax | Rowan | |

These 25 county health departments comprise slightly more than one-third of the local health departments in the State. The list does not include the largest or the smallest health depart-

*Dr. Chapman is regional medical director, Region II, Department of Health, Education, and Welfare, New York City; Mr. Springborn is a public health representative, Region III, Washington, D. C.; Dr. Norton is secretary-treasurer and State health officer, North Carolina State Board of Health, Raleigh, N. C.*

ments, nor does it constitute a cross section of all North Carolina county health departments.

The director of local health services of the North Carolina State Board of Health distributed a questionnaire to each of the 24 full-time local health officers and the 1 part-time health officer participating in the study. The questionnaire requested information about the community and specific data concerning clinic services, staff, and space utilization.

After ample time had passed to permit the local health officers to complete the questionnaire, a member of the staff of the Public Health Service regional office (Region III, Department of Health, Education, and Welfare) visited each of the 25 local health departments to interpret the meaning of any questions which were not clear. He also talked to various members of the local health department staffs to obtain their impression of their health center.

### Study Counties

From the data obtained it was possible to develop a composite picture of the 25 counties, their health centers, their services, their staffing patterns, and their problems. The "composite" county has a population of 38,137 persons, of whom 65 percent are white and 35 percent, nonwhite. Twenty-one percent of the population are urban, 79 percent, rural. The birth rate in these 25 counties was more than 3 times the death rate. In 1953 there were 1,071 births compared to 323 deaths. The annual per capita income was $830. The annual per capita expenditure for public health was $1.00. Slightly more than 0.1 percent of the annual per capita income was budgeted for public health purposes.

There were 18 practicing physicians and 7 dentists to serve the 38,137 persons in the composite county, a ratio of 1 physician to 2,119 persons and 1 dentist to 5,448 persons. The bed population ratio for the composite county was 2.66 beds per 1,000 population. All were general hospital beds. The utilization of beds was good, the average daily census being 72.5 percent of the total number of beds available.

Although the outpatient services offered by the 34 hospitals serving the 25 counties did not compare in quality or quantity to the services available in most metropolitan areas, they exceeded in quantity the outpatient services usually provided in predominantly rural areas. Six of the 34 hospitals maintained outpatient services. These 6 hospitals served 24 percent of the total population of the 25 counties. The remaining 28 hospitals offered only inpatient and emergency services.

The average size of the 25 health centers was 3,410 square feet. The average cost, including equipment, was $51,900, or 15.20 per square foot. The per capita cost of the health centers, including equipment was $1.36.

**Clinic services in 25 North Carolina counties, 1949**

| Type of clinic | Health centers conducting clinics | Patient visits to— | |
|---|---|---|---|
| | | All health centers | Health center clinics (percent) |
| Immunization | 25 | 58, 543 | 45. 0 |
| Food handlers | 18 | 16, 256 | 12. 5 |
| Tuberculosis | 23 | 14, 714 | 11. 3 |
| Venereal disease | 24 | 12, 676 | 9. 7 |
| Orthopedic | 13 | 10, 250 | 7. 9 |
| Maternal and child health (prenatal and well-baby) | 22 | 10. 172 | 7. 8 |
| 9th grade | 4 | 2, 324 | 1. 8 |
| Cancer | 2 | 1, 690 | 1. 3 |
| Preschool | 7 | 1, 273 | 1. 0 |
| Eye | 11 | 1, 196 | . 9 |
| Diabetes | 1 | 675 | . 5 |
| Ear | 1 | 150 | . 1 |
| Heart | 1 | 48 | . 03 |
| 12th grade | 1 | 45 | . 03 |
| Total | 153 | 130, 012 | |

The staffs of the local health departments studied, although not up to the quantitative standards recommended by the American Public Health Association, were not out of line with the staffing patterns of other rural health departments. All but 1 of the 25 county health departments had a full-time health officer. The population ratios for other staff members were: public health nurses, 1/10,834; sanitarians, 1/27,241; and clerks, 1/25,090.

The 10 leading causes of death in North Carolina—heart disease, brain hemorrhage, cancer, accidents, certain diseases of early infancy, in-

fluenza and pneumonia, tuberculosis, nephritis, congenital malformations, and general arteriosclerosis—followed the pattern that has been developing throughout the United States for decades.

The types of clinics held in the 25 counties, the number of patient visits to the clinics, and the number of health centers conducting each type of clinic are shown in the accompanying table.

The average amount of space provided for each public health nurse was 84 square feet. The space allotted to sanitarians averaged slightly more—104 square feet. The public health nurses and sanitarians, it was estimated, spent an average of 1½ hours in the office each working day.

In the health centers, 4.8 percent of the space was occupied by laboratories that were maintained in 22 of the 25 health centers. The average number of square feet of laboratory space was 168. Only 1 of the 25 local health departments employed a full-time laboratory technician at the time of the study.

Each of the 25 health centers had waiting rooms that were used as meeting places. The average seating capacity was 55. All of the health officers reported that the waiting rooms were used in the evenings by various community groups. Typical of these groups were local boards of health, voluntary health associations, local Red Cross chapters, PTA groups, medical societies, boards of education, and farm groups.

Nine health centers had separate conference rooms averaging 170 square feet in size, with an average seating capacity of 13. Only 5 health centers had a library, but all made some provision for placing professional books and journals at the disposal of their staffs.

## Health Services

Certain characteristics of the health services provided in these 25 rural health centers lend themselves well to discussion; some present basic challenges to present concepts of providing rural public health service.

### *Increasing Population*

The marked excess of births over deaths represents, in part at least, the success of past and present public health services, improvements in medical and hospital care, and a better economy. It also portrays rather dramatically the current upsurge in our total population. This increase in population will continue to require an expansion in local public health services and an increase in the number of practicing private physicians.

### *Financial Support*

The fact that little more than 0.1 percent of the per capita income of the population of these 25 counties is budgeted for local public health services should cause us to raise our professional eyebrows. Is this relatively small financial contribution for public health services commensurate with the public health needs of these rural people? Are we failing to dramatize to the taxpayer the value of and need for health services that still are not being provided? Or is it that we are failing to offer to people the types of health services they want and are willing to pay for?

### *Physicians and Dentists*

The physician/population ratio of 1 physician to 2,119 persons, although not meeting the recommended physician/population ratio, is not atypical of most rural communities. It does bring out the fact that if the degenerative and malignant diseases—those causing long-term illnesses—continue to increase in our aging population, the "physician hunger" of rural populations will tend to increase rather than to decrease. Some alleviation of this situation might be obtained rather quickly by the wider use of paramedical personnel to extend the services of those practicing physicians who are now available.

The dentist/population ratio of 1 dentist to 5,448 persons represents a longtime and widespread problem throughout the United States. The only optimistic factor in this picture is the growing practice of fluoridating public water supplies and the topical application of fluorides to the teeth of children who do not have access to a fluoridated water supply. A 60-percent reduction in dental caries among a large segment of the child population would permit the present number of dentists to engage in more

preventive dentistry, for which they now have little time.

### *Hospital Beds*

The hospital bed/population ratio of 1 bed per 2.66 persons is partly the result of the State and federally aided program which assists communities to build new hospitals and to expand existing ones. The average daily census of 72.5 percent indicates that the bed supply is being well used. No beds for the chronically ill were reported in these 25 counties. Although the population approached 1 million people, there were no diagnostic centers listed as such in the 25 counties.

### *Outpatient Services*

The availability of outpatient services to 24 percent of the population in the study area is noteworthy because it far exceeds the availability of such services in many rural areas in other States.

The fact that outpatient services are available to 85 percent of the residents of large metropolitan areas and to only a small percentage of rural residents should concern all rural health officers. Are these outpatient services merely a metropolitan luxury or is there a genuine but unmet need for them in rural areas? Is the existence of ample outpatient services in metropolitan areas merely coincidental with the existence in such areas of more and larger hospitals? Can methods be developed whereby outpatient services can be provided economically to rural residents who need them and can qualify for them? Answers to these and to other similar questions must be found if we are to develop a comprehensive program for detecting the chronic diseases in their early stages and minimizing their complications.

### *Health Center Cost*

The per capita cost of the 25 health centers of $1.36 was remarkably low for postwar construction. In North Carolina an upper limit has been placed on the size of all State-aided health centers, with graduated ceilings within certain population ranges. This action was deemed necessary to conserve the limited Federal and State funds available for construction of health centers in the State. It did have the desirable effect of channeling a larger percentage of available funds into rural areas that were economically less well off than metropolitan areas. The arbitrary limitation on the size of health centers, however, had a tendency to keep the per capita cost low. Other communities intending to use the per capita cost of $1.36 as a guide should take this factor into account. If there had been no ceiling on the size of the health centers, some undoubtedly would have been larger, which would have increased the per capita cost.

### *Staff/Population Ratios*

All but one of the 25 rural counties had a full-time health officer. This excellent coverage is typical of North Carolina, where local public health salaries are more realistic than those of many other States. It also reflects the policy of the State health department of placing the primary responsibility for local health protection on local health departments.

The ratio of 1 public health nurse to 10,834 persons, although short of national standards, is not low in comparison with other rural areas throughout the United States.

It does highlight the difficulty that will be encountered if local public health nurses are asked to provide bedside nursing services to the chronically ill. The public health nurses in these 25 counties are hard pressed now to maintain their daily work schedules. If bedside nursing is added to their many responsibilities, the need for additional nurses, as well as for more training for the nurses now on duty, will become demanding.

### *Leading Causes of Death*

The tabulation of the leading causes of death in North Carolina highlights the fact that undue emphasis may have been placed on the control of the infectious diseases after they had passed their peak incidence. It must be recognized, however, that maintaining the status quo will require the continuing expenditure of a significant amount of time and money. The cardiovascular diseases, cancer, brain hemorrhage, and accidents, which kill more than 75 percent of the persons who die each year, have not yet begun to be the subject of serious control efforts by the 25 local health departments

studied, although there are a few clinics for cancer, heart disease, and diabetes.

*Clinic Services*

An analysis of the table in which the various clinic services are enumerated (page 102) shows that the five types of clinics that were conducted most frequently by county health departments—immunization, food handlers, tuberculosis, venereal disease, and maternal and child health—accounted for 112,361 of the total 130,012 patient visits, or 86.4 percent of the total. Only the tuberculosis clinics are aimed primarily at the control of diseases which are in the list of the 10 most important causes of death. Only one of the local health departments conducts a cardiac clinic. In 1953, this clinic reported 48 patient visits. Another health department conducted a diabetes clinic and maintained supervision of some 600 patients with diabetes, at the request of local private practicing physicians. Two health departments conducted cancer clinics.

*Space Utilization*

The amount of space allotted to public health nurses and sanitarians, who, by their own estimate, spend an average of 1½ hours a day in the health center, gives food for thought. There is a definite trend toward group meetings and group education, as exemplified by weight control classes, patient education classes, and classes for expectant mothers (and even for expectant fathers). As long-term illnesses with their many complications gain in emphasis over acute infectious diseases, the multiplication of the duties of public health workers will demand more efficient methods of serving the public.

One way to permit scarce public health personnel to serve larger population groups is to bring people to health centers for group instruction rather than to send public health workers out to visit individuals in their homes. An example of this technique is the way practicing physicians have conditioned expectant mothers to go to hospitals for their deliveries rather than to have physicians waste precious time going to the home and waiting there for the infant to arrive. If this trend results in a need for more group instruction in health centers, additional room will be needed in which these groups can meet.

One way to provide for additional space needs in health centers is to plan and construct them in such a way that extensions may be added with a minimum of alterations. Another possible alternative is to design the office space for public health nurses, sanitarians, and other field workers in such a way that it may be used for purposes of group instruction when it is not in use as office space. This latter alternative will require some pioneering on the part of health officers, architects, and engineers, but could well result in the more efficient utilization of health center space without imposing any real hardship on public health workers.

*Laboratories*

Although 22 of the 25 health centers had laboratories, only 1 of the 25 health departments employed a full-time laboratory technician. Throughout the country there is a growing awareness of the need for diagnostic centers that can serve the needs of rural physicians. When laboratory services are not readily available, physicians often must rely on their clinical judgment to make difficult diagnoses or they must resort to costly and time-consuming expediencies to have laboratory work done for their patients at some distant laboratory or medical center. As soon as public health and medical leaders in local communities are convinced of the need for adequate local laboratory services, local laboratories, now inactive, may be activated and communities without laboratories may decide to obtain them. The lack of outpatient hospital services in these areas emphasizes the urgent need for the development of these assisting laboratory services.

Research workers each year are developing new tests for the chronic degenerative and malignant diseases. These tests can be of great help to rural physicians in establishing the early diagnosis of many diseases that are characterized by long periods of latency. They can help physicians to diagnose such diseases as cancer, diabetes, blood dyscrasias, nephroses, and even rheumatoid arthritis, earlier and with greater accuracy. Certainly, the patient will benefit from such early diagnoses. It would seem logi-


326578—55——2

cal, then, to look for the better staffing of local health center laboratories with well-trained technicians, who are masters of a wide variety of laboratory tests and are capable of operating the many laboratory instruments that are being made available for disease detection.

### *Meeting Space*

All of the health centers were provided with waiting rooms that can be used by community groups during the evening hours. This tendency to encourage community groups to use local health centers has proved to be an excellent way for health departments to provide a wider type of service and thereby earn community support for their programs. When local health departments resided in courthouse basements or attics, it was the rare individual indeed who knew where his local health department was located, the name of the local health officer, or what public health workers did to earn their money.

### *Construction Pointers*

When the Public Health Service regional representative visited each health center, he chatted with the health officer and with other members of the staff about the general "usability" of the health center and whether or not there were features about it that they would like to see changed. The uniform reply began with an expression of appreciation that they had gotten out of their antiquated quarters and into a modern health center in which they could work more efficiently and in which they could take pride. When pressed for their reaction to the design of their own health center, there were a few items they would like to see changed.

Eight health officers stated that storage space was inadequate. Eight mentioned that their health centers were not soundproof; in fact, privacy was almost completely lacking; voices carried clearly throughout the building and interfered with the conduct of interviews, conferences, and clinics. Seven said the heating system was not efficient; the ducts were placed at ceiling level, with the result that the temperature at floor level was too low. Radiant heating was not favored for southern climates. Six suggested that cement blocks, spray painted, plus waterproofing with a silicone type of spray would be just as attractive as plastered walls and the cost of maintenance would be lower. Five claimed that flat roofs often leaked and tended to intensify the summer heat. Air conditioning, or at least better insulation, was strongly recommended.

Other less repetitive suggestions included the separation of one of the three clinic rooms from the other two rooms with a solid wall; not pouring concrete floors over plumbing installations; and not having rest rooms open directly into waiting rooms.

## Summary and Conclusions

By means of a questionnaire, supplemented by a personal visit, 25 local health officers and their staffs in North Carolina were queried about their health centers, their health services, and certain of their public health problems. The health workers uniformly expressed their appreciation for the benefits derived from being located in a modern health center.

The excellent programs conducted in these health centers were found to be oriented primarily to the control of the acute infectious diseases and to the solution of maternal and child health problems. A start is now being made on programs designed to control the chronic noninfectious diseases and the accidents that are becoming the major causes of death in North Carolina.

The fact that only one full-time laboratory technician was employed by a local health department in the entire area, comprising 25 counties with a population of 953,425, is evidence of the sparsity of laboratory diagnostic services in these rural counties, which are deficient in hospital outpatient services.

This study suggests that, now that local health departments are being "disinterred" from their basement hideaways, continuing attention should be given to the planning and evaluation of the local health services provided in health centers and to their reorientation to current public health problems.

*Infantile diarrhea is a ubiquitous disease which has a high mortality rate, especially when it is unrecognized or treatment is delayed. The disease occurs not only as epidemics in nurseries but also as sporadic cases in the population.*

# A New Serotype of Escherichia Coli Associated With Infantile Diarrhea

By W. H. EWING, Ph.D., K. E. TANNER, B.S., and H. W. TATUM

AHITHERTO undescribed *Escherichia coli* serotype (O127: B8) associated with infantile diarrhea has been isolated from 121 stool cultures from 76 patients in 3 separate epidemics in Philadelphia, Pa., Cincinnati, Ohio, and Kamloops, B. C., and from cultures from sporadic cases of the disease in Mexico City. The results of bacteriological and serologic studies of these cultures and of related *E. coli* serotypes are reported.

For more than 40 years various investigators have studied *E. coli* cultures isolated from infantile gastroenteritis patients in which no recognized pathogens, such as members of the *Salmonella* or *Shigella* groups, were found. Results of earlier investigations (for references, see *14*, *17*, *1*) were inconclusive because only biochemical methods were used in attempts to differentiate between *E. coli* cultures isolated from infants with diarrhea and cultures from normal infants. By themselves, biochemical reactions proved inadequate for this purpose since, as is now known, different *E. coli* serotypes often give identical biochemical reactions. However, the extensive investigations of Kauffmann and his associates (*15*) established methods for definitive serologic typing of *E. coli* cultures and an antigenic schema in which the micro-organisms were classified.

Bray (*2*) and Bray and Beavan (*3*) apparently were the first to emphasize the association of a particular *E. coli* serotype with outbreaks of infantile diarrhea. The same type, now labeled O111: B4 (*14*), was isolated from 42 of 44 patients who had "infantile summer diarrhea." Independently, Varela and associates (*25*) in Mexico City isolated a bacterium which they named *Escherichia coli-gomez* from an infant who died of diarrhea. Later they isolated the same serotype from other patients. Varela found that the somatic antigens of *E. coli-gomez* were identical with those of *Salmonella adelaide* (O antigen 35) and he was able to employ *Salmonella* O35 antiserum in the identification of this particular *E. coli* serotype. Further studies on the antigenic relationship of *S. adelaide* and *E. coli-gomez*, as well as proof of the identity of the latter micro-organism and *E. coli* O111: B4, were given by Olarte and

*Dr. Ewing is in charge of, and Mrs. Tanner and Mr. Tatum are bacteriologists in, the Shigella Typing Laboratory, Communicable Disease Center, Public Health Service, Chamblee, Ga.*

Varela (*18*). Confirmatory investigations were made by Kauffmann (*16*) and in this laboratory (unpublished data).

The second *E. coli* serotype which has assumed importance because of its association with epidemic infantile diarrhea was described by Giles and his co-workers (*7*). Kauffmann and Dupont (*14*) found that the β serotype of Giles and associates (*7*) belonged to *E. coli* O group 55 and contained a new B antigen, B5. Smith (*21*) gave detailed descriptions of the α (O111 : B4) and β (O55 : B5) serotypes. Since 1945, cultures of *E. coli* O111 : B4 and O55 : B5 have been isolated during epidemics and from sporadic cases of infantile diarrhea in nearly all parts of the world.

Pertinent data regarding the two aforementioned serotypes are summarized in table 1. Also listed in the table are additional serotypes that were described in association with outbreaks of infantile diarrhea. As might be expected, epidemics have been reported in which *E. coli* serotypes O111 : B4 and O55 : B5 were not found and, in the examination of the *E. coli* flora from patients in such outbreaks, other serotypes common to the cases were reported. *E. coli* serotypes, other than those listed in table 1, also have been reported from outbreaks of infantile gastroenteritis, but further studies of their role in the disease are required. Cultures of *E. coli* O124 have been isolated repeatedly from individual patients and from outbreaks of gastroenteritis and acute diarrhea in both children and adults (*11*). For additional information on the subject of *E. coli* serotypes associated with infantile diarrhea, readers are referred to the bibliographies of the papers cited above and reference 8. Persons interested in methods for isolation and preliminary identification of *E. coli* serotypes associated with infantile diarrhea are referred to Ewing and Edwards (*13*).

The cultures of the new *E. coli* serotype were received from several sources. During 1951 and 1952, 12 cultures from 3 sporadic cases in Mexico City were received from Jorge Olarte of the Hospital Infantil. These strains were studied in connection with a cooperative study of *E. coli* serotypes in sporadic cases of infantile gastroenteritis by Olarte and Ewing (unpublished data). In December 1953, 39 cultures from 9 patients in an epidemic in Philadelphia were sent by Dr. George M. Eisenberg to Dr. Edwin Neter, Buffalo, N. Y., who forwarded them to this laboratory, and 2 cultures from 2 patients were received from Dr. Merlin Cooper, Cincinnati, Ohio. During the first 4 months of 1954 Dr. Eisenberg sent 23 cultures from 17 additional patients and Dr. Cooper sent 40 cultures taken from 40 other patients during the

**Table 1. Previously described Escherichia coli serotypes associated with infantile diarrhea**

| Antigens | | | Synonyms, culture numbers, and references | |
|---|---|---|---|---|
| O | K | H | | |
| 111 | B4 | 2, 12, 21, or nonmotile (−). | *Bacterium coli neapolitanum.* | Bray (*2*), Bray and Beavan (*3*). |
| | | | *E. coli-gomez* | Varela, Aguirre, and Carille (*25*). |
| | | | *B. coli* α type | Giles and Sangster (*6*). |
| | | | Type D433 | Taylor, Powell, and Wright (*23*). |
| | | | *B. coli*, B. G. T. | Rogers, Koegler, and Gerrard (*20*). |
| 55 | B5 | 2, 6, 7, or (−) | *B. coli* β type | Giles, Sangster, and Smith (*7*); Smith (*21*). |
| 26 | B6 | 11 or (−) | *E. coli* O26 | Biering-Sørensen, Knipschildt, and others, quoted by Ørskov (*19*). |
| | | | *E. coli* O26:E6 | Ørskov (*19*). |
| | | | Type E893 | Charter and Taylor (*4*), Taylor and Charter (*24*). |
| 112a, 112b | B13 | 18 | 1411–50 | Ewing and Kauffmann (*9*). |
| 112a, 112c | B11 | (−) | *Shigella guanabara* | De Assis (*5*). |
| 86a | B7 | 8, 9, 10, 11 or (−) | Type E990 | Charter and Taylor (*4*). |
| 119 | B14 | 6 | Aberdeen 537–52 | Smith (*22*). |
| 125 | B15 | 19 | Canioni, Vincent | Charter and Taylor (*4*). |
| 126 | B16 | 2 | E611 | Charter and Taylor (*4*). |

**Table 2. Biochemical reactions of Escherichia coli O127:B8 and related serotypes**

| Serotype | H antigens | Number of cultures examined | Glucose, lactose, mannitol | Adonitol, inositol | Sucrose | Salicin | Sorbitol | Indol MR | VP citrate $H_2S$ | Motility |
|---|---|---|---|---|---|---|---|---|---|---|
| O127:B8 (4932–53, etc.) | (−) | 107 | AG | (−) | A, Ag (A) | (−) | [1](−) | [2](+) | (−) | (−) |
| O86:B7 (E990, etc.) | −, 8. 9, 10, or 11 | 13 | AG | [3](−) | V | V | [4]AG | (+) | (−) | (+/−) |
| O127a, 127b:B10 (2160–53, etc.). | 4 | 9 | AG | (−) | AG | AG | AG | (+) | (−) | (+) |
| O86a, 86b:B9 (5017–53). | Undescribed [5] | 1 | AG | (−) | (−) | AG | AG | (+) | (−) | (+) |
| O90 | (−) | 1 | AG | [3](−) | (−) | AG | AG | (+) | (−) | (−) |

NOTE: AG, acid and gas production within 24 hours. A, acid only. (A) acid production delayed 48 hours or longer. V, variable, some strains positive, some negative.
−, test negative; +, test positive.
[1] 10 cultures produced acid from sorbitol after prolonged incubation (30 days).
[2] Indol production was weak in most strains; 72 or more hours' incubation was required.
[3] 2 cultures produced acid from adonitol. The O90 culture also fermented adonitol.
[4] 1 culture failed to ferment sorbitol.
[5] This serotype possessed an H antigen that differed from any known *E. coli* H antigen.

same outbreak. In February and April 1954, five cultures were received from Dr. E. T. Bynoe of the Laboratory of Hygiene, Ottawa, Canada. Dr. Bynoe had received the cultures from Dr. C. E. Dolman, Vancouver, B. C., who had received them from Dr. F. P. Sparks, pathologist at the Royal Island Hospital, Kamloops, B. C., where they had been isolated from 5 patients in an epidemic of 17 cases of acute gastroenteritis in infants during September 1953. In this epidemic 8 babies were seriously ill and the remainder were moderately ill, but there were no fatalities. The cases in the Philadelphia and Cincinnati outbreaks were reported to be relatively severe—3 deaths occurred in the Philadelphia epidemic and 2 deaths in the Cincinnati outbreak.

We have been informed by the above-mentioned individuals that *E. coli* serotype O127:B8 predominated in the stools during the acute stage of illness and that members of the *Salmonella* and *Shigella* groups were looked for but were not present. In some instances, serotype O127:B8 was the only coliform bacterium in the stool cultures. Cultures of this serotype were not recovered from well babies during any of the outbreaks and, to date, none has been received in this laboratory from sources other than diarrheal patients.

We understand that further data on the clinical aspects of infantile diarrhea, the extent and nature of the outbreaks, and other details concerning the epidemics in Philadelphia and Cincinnati will be published by Eisenberg and Cooper in separate reports. The details of the epidemic in British Columbia probably will be published by the investigators of the outbreak.

The other two *E. coli* serotypes described for the first time in this paper are O86a, 86b:B9, and O127a, 127b:B10:H4. Only one strain (5017–53) of O86a, 86b:B9 was available for study. This was isolated from a normal individual who was a member of the staff of a Philadelphia hospital. Nine cultures (2160–53 and so on) of the other serotype (O127a, 127b:B10) were recovered during a survey from stools of pediatric patients who did not have diarrheal disease.

Included in these studies were several strains of the previously described serotype O86:B7, which had been isolated recently from the stools of infants who had diarrhea. The cultures were forwarded to this laboratory for typing. The type strain for this serotype was received in 1950 from Dr. Joan Taylor (*4*, *24*).

## Biochemical Reactions

The biochemical reactions of cultures of *E. coli* serotypes O127:B8, O86:B7, and related

**Table 3. The relationship of the O antigens of Escherichia coli serotypes O127:B8, O86:B7 and O group 90**

| O antigen suspensions (100° C., 1 hour) | *E. coli* O antiserums | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 86 | | | 90 | | | 127 | | |
| | Unabsorbed | Absorbed by— | | Unabsorbed | Absorbed by— | | Unabsorbed | Absorbed by— | |
| | | 127 | 90 | | 127 | 86 | | 86 | 90 |
| 86 (E990) | [1] 5, 120 | 1, 280 | 320 | 640 | 160 | 0 | 0 | 0 | 0 |
| 90 | 2, 560 | 640 | 0 | 5, 120 | 640 | 1, 280 | 1, 280 | 640 | 0 |
| 127 (4932–53) | 1, 280 | 0 | 0 | 640 | 0 | 640 | 20, 480 | 20, 480 | 1, 280 |

[1] Agglutination titers are expressed as the reciprocal of the highest dilution that gave strong agglutination.

cultures are listed in table 2. The reactions of the 121 strains of serotype O127: B8—which were remarkably uniform when the geographic locations of the sources were considered—were as follows: Glucose, lactose, and mannitol were fermented with gas production within 24 hours' incubation by all cultures. All cultures fermented sucrose, but a few strains required 48 hours' incubation for the reaction to appear, and some strains did not produce gas from this substrate. Salicin, adonitol, and inositol were not attacked during 30 days' incubation. The majority of strains did not ferment sorbitol within 30 days, but 10 cultures produced acid from this carbohydrate after 30 days' incubation. Hydrogen sulfide was not detected in triple sugar iron agar, acetylmethylcarbinol was not produced, and urea was not hydrolyzed. All strains failed to grow on Simmons' citrate agar, and all were nonmotile. The methyl red test was positive. All cultures produced indole but required 72 hours' incubation or longer to produce detectable amounts of indole from 2 percent Bacto peptone water (Kovac's reagent).

## Serologic Studies

The methods used for serologic studies and for antiserum production were similar to those previously reported (*9*, *10*, *12*) and were based upon methods advocated by Kauffmann (*15*).

### *Relationships of the O Antigens*

Heated broth antigens of culture 4932–53 and other strains of the new serotype referred to as O127: B8 were tested in antiserums for all of the 126 known *E. coli* O antigen groups in dilution of 1: 100. Positive agglutination reactions were obtained in antiserums for O groups 86 and 90; all other tests were negative. Upon titration of O antigen suspensions in these two O antiserums there was some variation in the titers to which the strains were agglutinated. The

**Table 4. The interrelationship of the O antigens of Escherichia coli cultures of O groups 86, 90, and 127**

| O antigen suspensions (100° C., 1 hour) | *E. coli* O antiserums (unabsorbed) | | | | |
|---|---|---|---|---|---|
| | 86a (E990) | 90 | 127a (4932–53) | 127a, 127b (2160–53) | 86a, 86b (5017–53) |
| 86a (E990) | 5, 120 | 640 | 0 | 5, 120 | 5, 120 |
| 86a, 86b (5017–53) | 20, 480 | 640 | 0 | 10, 240 | 20, 480 |
| 90 | 2, 560 | 5, 120 | 1, 280 | 5, 120 | 160 |
| 127a (4932–53) | 1, 280 | 640 | 20, 480 | 5, 120 | 0 |
| 127a, 127b (2160–53) | 10, 240 | 1, 280 | 10, 240 | 20, 480 | 640 |

average titer was 1:1,280 in O86 antiserum and 1:640 in O90 antiserum (tables 3 and 4). When heated broth antigens prepared with cultures of *E. coli* O groups 86 and 90 were tested in O antiserums prepared with culture 4932–53 and identical strains, O group 86 cultures failed to react, whereas the antigens for O group 90 were agglutinated in dilutions of 1:640 to 1:1,280 (tables 3 and 4). The results of reciprocal agglutinin absorption tests with these O antiserums (table 3) indicated that the O antigens of serotype O127:B8 cultures were related unilaterally to those of O group 86; whereas the relationship to O group 90 was bilateral or reciprocal. However, since the O antigens of serotype O127:B8 strains were not identical with those of *E. coli* O group 90, it was decided to assign these cultures to a new *E. coli* O antigen group, namely, O127. This decision was made after consultation with Kauffmann and Ørskov of the International Salmonella and Escherichia Center, Copenhagen, Denmark.

During the study of the O antigens of cultures of *E. coli* O127:B8, a number of other cultures related to *E. coli* O groups 86 and 90 were reinvestigated. The results of agglutination tests in unabsorbed O antiserums (table 4) indicated the interrelationship of this group of cultures. Reciprocal agglutinin absorption tests indicated that the O antigens of cultures 2160–53, 2210–53, and others like these, were identical. Similar absorption tests (table 5) also showed that the O antigens of O group 127 strains and culture 2160–53 were closely related but not identical. The O antigens of these two serotypes may be expressed by the use of arbitrary formulas, as follows:

4932–53 ..... O127a
2160–53 ..... O127a, 127b

It should be mentioned that all of the 121 cultures associated with sporadic cases and with epidemics of infantile diarrhea belonged to O group 127a, whereas the 9 cultures like 2160–53 were O group 127a, 127b. The former group of strains were nonmotile and somewhat less active as regards their biochemical reactions, and were further characterized by a distinct B antigen, as will be shown. The nine cultures of the latter group were motile (H antigen 4).

**Table 5. Relationship of the O antigens of Escherichia coli serotypes O127a:B8 and O127a, 127b:B10**

| O antigen suspensions (100° C., 1 hour) | O antiserums | | | |
|---|---|---|---|---|
| | 127a (4932–53) | | 127a, 127b (2160–53) | |
| | Unabsorbed | Absorbed by 127a, 127b | Unabsorbed | Absorbed by 127a |
| 127a (4932–53) | 20, 480 | 0 | 5, 120 | 0 |
| 127a, 127b (2160–53) | 20, 480 | 0 | 20, 480 | 10, 240 |

**Table 6. O antigenic relationship of Escherichia coli serotypes O86a:B7 and O86a, 86b:B9**

| O antigen suspensions (100° C., 1 hour) | O antiserums | | | |
|---|---|---|---|---|
| | 86a | | 86a, 86b | |
| | Unabsorbed | Absorbed by 86a, 86b | Unabsorbed | Absorbed by 86a |
| 86a (2805–52) | 5, 120 | 0 | 5, 120 | 0 |
| 86a, 86b (5017–53) | 20, 480 | 0 | 20, 480 | 5, 120 |

The relationships of the O antigens of *E. coli* O86a and O86a, 86b (5017–53) are given in table 6. The relationship of these two serotypes to each other was analogous to that noted between serotypes of O group 127, mentioned above. The H antigen of culture 5017–53 was not agglutinated by H antiserums prepared with the 33 known *E. coli* H antigens. Thus, the H antigen of this serotype represented a new, unnumbered *E. coli* H antigen.

The results of reciprocal agglutinin absorption tests indicated that the O antigens of *E. coli* serotypes O86a, 86b, and O127a, 127b were related but not identical. A strong specific factor remained in each antiserum for the homologous serotype following reciprocal absorptions.

### *B Antigenic Relationships*

When cultures of the *E. coli* serotype referred to as O127:B8 first were received in the laboratory for identification, they were tested on slides

**Table 7. The relationship of the K antigens of certain Escherichia coli serotypes**

| K antigen suspensions | *E. coli* K (B) antiserums | | | | |
|---|---|---|---|---|---|
| | B2 | B7 | B8 | B10 | B9 |
| B2 (O8) | 320 | 0 | 0 | 80 | 0 |
| B7 (O86) | 40 | 320 | 0 | 40 | 40 |
| B8 (O127) | 40 | 0 | 320 | 80 | 0 |
| B10 (O127a, 127b) | 0 | 0 | 0 | 640 | 0 |
| B9 (O86a, 086b) | 0 | 0 | 0 | 0 | 320 |
| K–O90 [1] | 0 | 40 | 0 | 80 | 0 |

[1] The K antigen of the *E. coli* O90 strain was undetermined.

with O and OB antiserum for the *E. coli* serotypes that have been associated with cases of epidemic infantile diarrhea. Living suspensions of these cultures were not agglutinated by any antiserum except that for O86, in which most of the living suspensions reacted to a greater or lesser extent. Living suspensions did not react in B7 (O86: B7) antiserum. The reason for this apparent discrepancy is believed to lie in the fact that the living O127: B8 strains were not entirely O inagglutinable and therefore reacted in the higher titered O86 antiserum and failed to react in the O86: B7 antiserum which had a relatively lower O titer. Heated broth antigens of several O127: B8 strains later were tested in O86: B7 antiserum and it was found that they reacted in dilutions of 1: 160.

Living suspensions of the new *E. coli* serotype then were tested on slides in antiserums prepared with all of the 61 known *E. coli* K antigens. Positive agglutination tests were obtained only in antiserum for B antigen 2 (O8: B2). In subsequent slide tests it was found that living suspensions of all 121 strains of serotype 127: B8 reacted in B2 antiserum. When K antigens prepared from representative strains of this serotype were titrated in serial dilutions of B2 antiserums, all strains tested reacted in this antiserum at 1: 40 but not in higher dilutions (table 7). A K antigen suspension made with a culture of *E. coli* O8: B2 did not react in OB antiserum prepared with serotype O127: B8.

The results of reciprocal agglutinin absorption tests (table 8), using living suspensions, confirmed the individuality and specificity of thermolabile somatic antigens B2 and B8. That the thermolabile somatic antigen of *E. coli* O127: B8 was in fact a B antigen was shown by absorption tests in which all agglutinins were removed from OB antiserum for O127: B8 when the antiserum was treated with a heated (100° C., 1 hour) suspension of the homologous culture (table 8). The antibody binding power of the thermolabile somatic antigen was not destroyed by heat at 100° C. Since this B antigen was not identical with, or significantly related to, any described *E. coli* K antigen, it was designated "B8."

Two other undescribed B antigens were characterized during the examination of cultures related to *E. coli* O groups 86, 90, and 127. One of these was found in culture 5017–53 (O86a, 86b) and the other occurred in the nine cultures that belonged to O group 127a, 127b. The B antigens of these cultures were not related significantly to any known *E. coli* K antigen or to those described herein (table 7). The designation B9 was assigned to the thermolabile somatic antigen of culture 5017–53 and the comparable antigen of culture 2160–53 was designated B10. That these two thermolabile somatic antigens, B9 and B10, actually were B antigens was demonstrated by appropriate absorption tests.

It was possible to prepare pure B7 antiserum by absorption of O86a: B7 antiserum with unheated or with heated suspensions of culture 5017–53 (O86a, 86b: B9). Similarly, a pure B8 antiserum was prepared by absorption of O127a: B8 antiserum with either heated or unheated suspensions of serotype O127a, 127b: B10. These absorbed antiserums agglutinated living cultures of the respective serotypes but did not react with heated suspension.

## Summary

The biochemical and serologic reactions of 121 cultures of the new *Escherichia coli* serotype O127: B8 associated with infantile diarrhea are described. The cultures of the new serotype were isolated from cases of infantile diarrhea in three separate epidemics in Philadelphia, Pa., Cincinnati, Ohio, and Kamloops, B. C., and from sporadic cases of this disease in Mexico City.

**Table 8. Comparison of the B antigens of Escherichia coil serotypes O127a:B8 and O8:B2**

| Antigen suspensions | B antiserums | | | | |
|---|---|---|---|---|---|
| | B2 | | B8 | | |
| | Unabsorbed | Absorbed by O127:B8 (unheated, formalinized) | Unabsorbed | Absorbed by— | |
| | | | | O8:B2 (unheated, formalinized) | O127:B8 (100° C., 1 hour) |
| *E. coli* O8:B2, unheated | 320 | 320 | 0 | 0 | ---------- |
| 100° C., 1 hour | 2, 560 | 2, 560 | 0 | 0 | ---------- |
| *E. coli* O127a:B8, unheated | 40 | 0 | 160 | 160 | 0 |
| 100° C., 1 hour | 0 | 0 | 2, 560 | ---------- | 0 |

The O antigens of the new serotype constitute a new *E. coli* O antigen group, 127, and the thermolabile somatic antigen of the cultures was found to be an undescribed B antigen which was designated B8. All of the 121 strains of serotype O127: B8 were nonmotile.

Two other *E. coli* serotypes, O86a, 86b: B9 and O127a, 127b: B10: H4, also are described. These two serotypes were isolated from normal individuals.

The O, B, and H antigens of the new *E. coli* serotypes are compared with those of previously described *E. coli* antigens and details of the relationships noted are presented.

• • •

*Since this paper was written, and up to October 1, 1954, we have received 29 additional cultures of E. coli O127: B8, representing 43 additional cases of infantile diarrhea from outbreaks in Albany, N. Y., New Jersey, and sporadic cases in California and Chicago, Ill.*

**REFERENCES**


(1) Braun, O. H.: Das Problem der Pathogenität von *Escherichia coli* in Säuglingsalter. Heidelberg, Germany, Springer-Verlag, 1953.

(2) Bray, J.: Isolation of antigenically homogenous strains of *Bact. coli* neapolitanum from summer diarrhea of infants. J. Path. & Bact. 47: 239–247 (1945).

(3) Bray, J., and Beavan, T. E. D.: Slide agglutination of *Bacterium coli* var. neapolitanum in summer diarrhea. J. Path. & Bact. 60: 395–401 (1948).

(4) Charter, R. E., and Taylor, J.: Cultural and serological reactions of strains of *Bact. coli* isolated from babies. J. Path. & Bact. 64: 729–734 (1952).

(5) De Assis, A.: *Shigella guanabara*, tipo serologico destacado do grupo do *B. ceylonensis-dispar*. O Hospital 33: 505–518 (1948).

(6) Giles, C., and Sangster, G.: Outbreak of infantile gastro-enteritis in Aberdeen: Association of a special type of *Bact. coli* with infection. J. Hyg. 46: 1–9 (1948).

(7) Giles, C., Sangster, G., and Smith, J.: Epidemic gastro-enteritis in infants in Aberdeen during 1947. Arch. Dis. Child. 24: 45–53 (1949).

(8) Edwards, P. R., and Ewing, W. H.: The status of serologic typing in the family Enterobacteriaceae. Am. J. Pub. Health 42: 665–671 (1952).

(9) Ewing, W. H., and Kauffmann, F.: A new coli O antigen group. Pub. Health Rep. 65: 1341–1343 (1950).

(10) Ewing, W. H., Hucks, M. C., and Taylor, M. W.: Interrelationship of certain *Shigella* and *Escherichia* cultures. J. Bact. 63: 319–325 (1952).

(11) Ewing, W. H.: Serological relationships between *Shigella* and coliform cultures. J. Bact. 66: 333–340 (1953).

(12) Ewing, W. H., Tanner, K. E., and Dennard, D. A.: The Providence group: An intermediate group of enteric bacteria. J. Infect. Dis. 94: 134–140 (1954).

(13) Ewing, W. H., and Edwards, P. R.: Isolation and preliminary identification of *Escherichia coli* serotypes associated with cases of epidemic diarrhea of the newborn. Pub. Health Lab. 12: 75–81 (1954).

(14) Kauffmann, F., and Dupont, A.: *Escherichia* strains from infantile epidemic gastroenteritis. Acta path. et microbiol. Scandinav. 27: 552–564 (1951).

(15) Kauffmann, F.: Enterobacteriaceae. Copenhagen, Denmark, Ejnar Munksgaard, 1951.

(16) Kauffmann, F.: On antigenic relationships between *Escherichia* strains from infantile enteritis and *Salmonella* or Arizona strains. Acta path. et microbiol. Scandinav. 31: 355–259 (1952).

(17) Neter, E., Webb, C. R., Shumway, C. N., and Murdock, M. R.: Study on etiology, epidemiology, and antibiotic therapy of infantile diarrhea, with particular reference to certain serotypes of *Escherichia coli*. Am. J. Pub. Health 41: 1490–1496 (1951).

(18) Olarte, J., and Varela, G.: A complete somatic antigen common to *Salmonella adelaide*, *Escherichia coli-gomez*, and *Escherichia coli* O111: B4. J. Lab. Clin. Med. 40: 252–254 (1952).

(19) Ørskov, F.: On the occurrence of *E. coli* belonging to O-group 26 in cases of infantile diarrhoea and white scours. Acta path. et microbiol. Scandinav. 29: 373–378 (1951).

(20) Rogers, K. B., Koegler, S. J., and Gerrard, J.: Chloramphenicol in treatment of infantile gastroenteritis. Brit. Med. J. 2: 1501–1504 (1949).

(21) Smith, J.: The association of certain types (α and β) of *Bact. coli* with infantile gastroenteritis. J. Hyg. 47: 221–226 (1949).

(22) Smith, J.: The association of serological types of *Bacterium coli* with infantile gastroenteritis. J. Path. & Bact. 65: 503–511 (1953).

(23) Taylor, J., Powell, B. W., and Wright, J.: Infantile diarrhoea and vomiting. A clinical and bacteriological investigation. Brit. Med. J. 2: 117–141 (1949).

(24) Taylor, J., and Charter, R. E.: The isolation of serological types of *Bact. coli* in two residential nurseries and their relationship to infantile gastroenteritis. J. Path. & Bact. 64: 715–728 (1952).

(25) Varela, G., Aguirre, A., and Carille, J.: *Escherichia coli-gomez*, nueva especie aislada de un caso mortal de diarrea. Bol. méd. Hosp. inf., Méx. 3: 3–7 (1946).

# technical publications

## Distribution of Health Services in the Structure of State Government, 1950

*Public Health Service Publication No. 184, parts 1–4. 1954. By Joseph W. Mountin, Aaron W. Christensen, Evelyn Flook, Edward E. Minty, Rubye F. Mullins, and Georgie B. Druzina. 360 pages; tables. $1.90.*

Distribution of Health Services in the Structure of State Government, a revision of Public Health Bulletin No. 184, third edition, 1940, is now available in a single volume. The four parts—Part 1. Administrative Provisions for State Health Services; Part 2. General Services and Construction of Facilities for State Health Programs; Part 3. Personal Health Services Provided by State Government; Part 4. Environmental Health and Safety Services Provided by State Government—each released under separate cover as the data were prepared, have been bound for the convenience of the reader in a single publication, with a table of contents added. No revisions have been made in the material as previously presented in the separate parts.

## State Tuberculosis Control Programs As Planned for Fiscal Years 1954 and 1955

*Public Health Service Publication No. 396. 1954. 24 pages.*

State program plans for tuberculosis control, fiscal years 1954 and 1955, are presented in abstract form in this booklet. Submission to the Public Health Service of a plan of operations for carrying out public health programs is required of all State agencies participating in Federal grants-in-aid for health work.

The abstracts reflect in concise form the proposed elements as described by the responsible State officials. No attempt was made to evaluate program content, and clarification of descriptions, interpretations, and editorial changes were kept to a minimum.

The booklet also presents a summary of the needs and problems significant to the tuberculosis control program as expressed by State program directors.

In addition, selected administrative information related to each State's tuberculosis control program is shown in tabular form. These data include placement of responsibility for tuberculosis control in the health department and staff assigned to the program.

**This section carries announcements of all new Public Health Service publications and of selected new publications on health topics prepared by other Federal Government agencies.**

**Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.**

**The Public Health Service does not supply publications issued by other agencies.**

A SPECIAL SECTION


# The Practice of Public Health, 1954

"AT THE BEGINNING of our school year at Harvard, I usually walk silently into the classroom and write on the blackboard the question, 'What do the people want done about their health?' The people must be part of our health team if our work is to be effective. . . .

"Learning people's attitudes about health; having the value of their advice in planning; and giving them the opportunity to participate in working out their own health programs—this is helping people to help themselves, which has become such an important watchword in international health work. This is part of community organization and each of us in public health can understand its principles sufficiently well to make our work more productive."

HUGH R. LEAVELL, M.D., DR.P.H.
*President, American Public Health Association, 1953–54.*
*Presidential address to the American Public Health Association at the Eighty-second annual meeting in Buffalo, N. Y. October 12, 1954.*

a topical and selected report of the 82d annual meeting of the

AMERICAN PUBLIC HEALTH ASSOCIATION

and related organizations held at Buffalo, N. Y. Oct. 11–15, 1954

*Reader's guide on page 117*

# The APHA Conference Report

The recent advances in research and methodology . . . the day-to-day experiences of the "shoe-leather" health worker . . . the trends in performance and practice . . . the problems and the new needs stemming from changing conditions and the old needs demanding attention and fulfillment . . . all these are to be observed in the wide panorama of public health practice as it is presented at the annual conference of the American Public Health Association and its related organizations.

Here, the scientist, the teacher, the technician, and the practitioner, each has the opportunity to place in proper perspective the relationship of his own work to that of others in his immediate field. More than that he can discern the relationship that work holds to the multiplicity of public health activities. Here, some technique, some method, some principle, in a field far remote from his own, might come to light which could be of benefit to his own work.

Unfortunately, it is impossible for all in the public health field to attend the annual meetings. And even those who do attend can be present at but a few meetings outside of their own special professional interests. It was in this spirit, that of presenting the panorama in a succinct, easy-to-read form so the whole and its many facets could be seen at once, that *Public Health Reports* presented the original conference report.

Many authors have cooperated with the science editors in this task. Without such help the quality of the reports would have suffered even more than it must through the necessity of reduction.

From a quantitative view, this report represents a notable gain numerically and percentagewise. Summarized here are 192 papers.

Many of the papers reported will be printed in full in the *Journal of the American Public Health Association*. A few others will be published by other professional journals.

## List of sections of the American Public Health Association

Dental Health
Engineering
Epidemiology
Food and Nutrition
Health Officers
Industrial Hygiene
Laboratory
Maternal and Child Health
Medical Care
Public Health Education
Public Health Nursing
School Health
Statistics

## Among the related organizations participating in the 82d APHA Conference

Associations:

American School Health
Business Management in Public Health
American Association of Hospital Consultants
Hospital Planning Agencies
Maternal and Child Health and Crippled Children's Directors
Public Health Cancer
American Association of Public Health Physicians
American Association of Registration Executives
Inter-American Association of Sanitary Engineering, U. S. Section

Conferences:

Professors of Preventive Medicine
State Directors of Public Health Education
Municipal Public Health Engineers
State and Provincial Public Health Laboratory Directors
American Public Health Veterinarians
State Sanitary Engineers
Organization of Federation for the Improvement of Medical Care Through Group Practice and Prepayment

Others:

Biometrics Society
Cooperative Health Federation of America
International Society of Medical Health Officers
Military Government-Civil Affairs Public Health Society
National Sanitation Foundation
Nurse Directors, City Health Departments
New York State Public Health Statisticians
Union-Management Medical Program Administrators
National Citizens Committee for the World Health Organization

# Community Self-Surveys . . .

*Is the community self-survey technique an effective instrument for public health action? This question is posed, and, from field studies of three community self-surveys, some answers are provided.*

## Self-Survey Objectives Not Fully Realized

There are more accurate, more effective, and less time-consuming ways of arranging a systematic fact collection than the community health survey, but the technique does succeed in mobilizing community resources for the achievement of some well-defined health goals, according to Christopher Sower, Ph.D., associate professor, department of sociology and anthropology, Michigan State College.

Sower came to this conclusion after observing a county survey that involved interviewing over 10,000 families in 23 communities. The public health officials, he said, were concerned about such problems as faulty control of contagious disease, lack of immunization, and widespread use of unpasteurized milk. They sponsored a health survey to foster public education and obtain information for better health planning—objectives which, in Sower's opinion, weren't completely realized. He based his conclusion on "fairly systematic observation" for a year after the activity was completed.

### *Test Results*

In the first place, he noted, the study included only about half the total households in the county. Although no work has been done to determine the underenumerated areas either geographically or socially, it seems obvious, said Sower, that the survey findings reflect this sample bias. As for public education, he found little evidence that the study process or its findings had aroused much enthusiasm or led to community health action.

On the other hand, county health council meetings have been much better attended since the survey, according to Sower, and the county health department has reported an increase in requests for such services as water testing. The sponsors believe actual work on the survey has interested the volunteer organizers and interviewers in health problems. It is possible that their influence may create a climate of opinion which will be favorable to health programs for several years, he said.

### *Social Organization*

The achievement of many health education goals, said Sower, is related to the beliefs, leadership, and organization patterns of the community in which the action is initiated. In this project, he found that much of the actual interviewing was done by women volunteers who didn't believe there was much of a health problem in the community and saw no reason for a survey. Most of them thought of health in a curative, here-and-now framework and had little understanding of long-time objectives. The women, in turn, were organized by community leaders who shared their views rather than those of the public health officials.

The local leaders, according to Sower, participated in the survey because of feelings of obligation to the professional sponsors, and the women were reached through loyalty to individuals and local organizations. An important element in the situa-

## Reader's Guide

tion was the fact that the project was initiated by physicians—a group to which the community conceded a right to make decisions on health.

Before the action could be completed, he said, three stages in a pattern of social relationships had to be fulfilled—initiation, legitimation (the authority to justify action), and execution. There is sufficient regularity in human community behavior, he continued, to permit the trial in comparable community projects of the sociologic generalizations drawn from this situation.

## Public Health Field Needs The Social Sciences

*Can formal surveys provide a better understanding of community organization and function than daily experience has already given the regional health officer, the Community Chest executive, or the local politician?*

*Specifically, can the community self-survey technique, developed by social scientists, serve as an effective instrument for public health action?*

These questions were posed by Odin W. Anderson, Ph.D., research director of the Health Information Foundation, New York City, in the course of his remarks opening a symposium on community self-surveys in health. He gave no answers, but said that he trusted his listeners would have enough material to form their own opinions after all the talks were given.

During the sanitation and communicable disease stages, public health programs were rooted in the laboratory sciences, Anderson continued. But vital public health is now concerned with people and communities and is looking to the social sciences for assistance in the promotion, organization, and administration of its programs.

### *Public Opinion*

It is in social and community organizations that health programs are planned and promoted, he said, and it is there that they succeed or fail. Unless the programs are firmly supported by the general public, Anderson warned, they have little chance of success.

Physicians, nurses, sanitarians, health educators, and other specialists in the field know quite well the conditions which constitute health problems in a given area, he said, but they sometimes find that citizens of the community don't accept their conclusions.

There is always a lag between public health knowledge and its application, according to Anderson. He suggested that social science might shorten the present gap by providing techniques for the collection of data on social and community organizations.

### *Other Areas*

Cost and utilization factors and legal problems associated with the planning and administrative phases of health programs are another area to which, Anderson believes, social science methods might be applied.

He also suggested that social science principles and techniques could be used in the study of the various conditions under which disease arises. In every time and place, he said, there is a disease pattern related in some way to such social conditions as the state of the arts and sciences, the level of living, composition of the population, and many other factors.

He concluded that, before the social scientist and the public health specialist can unite for effective work, each must learn more about the other's field.

## Finds Experts Could Aid Community Self-Study

Communities cannot isolate themselves from resources and expert guidance available to them from beyond community borders and still do an effective job in study and action problems in health practice, according to Floyd Hunter, Ph.D., associate professor at the School of Social Work, University of North Carolina.

Dr. Hunter was a member of the university's team which appraised the Salem, Mass., self-study. The 2-year appraisal, characterized by Hunter as a study of a self-study, was restricted to observing the social and power factors in the community organization and in the functioning of the self-survey.

The research team, Hunter said, found the community no exception to the general pattern of social stratification. Salem's study consisted of piecing together the opinions of a group of health agency executives related to their conceptions of health needs, he added.

Hunter also reported:

Salem did a complete study of health needs. It did not seek outside help in completing its study, nor did it call upon the observers for help.

If the community had had good outside help, it might have received more for its money.

Salem went about solving its health problems in a manner that conformed to its general pattern of problem-solving. Community functions in Salem are delegated to specific functioning groups, and, consequently, health organizations and their leaders had a greater interest in promoting and extending a health study than other community groups.

A small proportion of the total population was involved in the study, which was conducted by committee, behind closed doors, with public participation virtually limited to hearing the conclusions.

The formation of the self-study committee was subject to the general economic, political, and social processes that bear upon the local parent sponsoring body of the study, the community council.

Matters of communitywide policy in relation to health problems inevitably involved the community power structure. This was demonstrated in the relationship estab-

lished between the upper echelons of the power structure, mainly composed of industrial and commercial leaders, and the leadership of the committee, chiefly professional health workers and subleaders in the community. Committee members generally followed traditional role expectations.

A few leaders emerged in the survey process who were primarily instrumental in furthering the self-study. The health agencies and the members of the study committee were affected by the restrictions and limitations of the traditional social arrangements in the community. Salem's ethnic pattern showed a dominant minority, followed by five other minorities. The lack of social communicability between these conflicting groups has an important bearing on solving health problems.

There was no going into the details of agency operations, personnel practices, and the like, no depth in the examination of agency services or resources.

After all the pains and processes of study were finished, a health center was realized. Of several recommendations made by the self-study committee, the health center recommendation was the only one acted upon immediately. This immediacy of action reflected the interest of the health director and a few people close to him.

## Alabama Study Action Came From One Group

Citizen participation in selecting health problems that need study is a device of crucial importance, said Solon Kimball, Ph.D., professor of education, Columbia University Teachers College.

This type of action, he explained, provides a mandate without which public health officers are less inclined to enter fields of possible controversy.

When people have an opportunity to examine conditions in their communities, proposals for improvement carry widespread support, according to Kimball, who illustrated his discussion by showing application of the self-survey technique in a study of health conditions in Talladega, Ala. The study was made from 1951 to 1953 by residents of the city with the aid of a grant from the University of Alabama.

### *Citizen Participation*

All decisions on scope, organization, and policy were placed in the hands of the community, Kimball reported. This arrangement, he said, pleased both the residents of the town, who were wary of probing outsiders, and the social scientists, who wanted to watch a community process unfold with minimum external disturbance.

Approval of the survey was readily secured from the county medical association and the board of public health, he continued. The chamber of commerce, which had initiated the study, then arranged for a series of public meetings and invited the principal institutions and industries and each civic, social, and religious group to send two delegates.

At these meetings, the citizens of Talladega elected a group to direct the survey and suggested health problems for this organization's study. Kimball said that some of the recommended items were garbage collection, city water fluoridation, school performance and health, Negro housing, stream pollution, and rural health. The newly elected officers based their program on these and other citizen recommendations.

### *University Observers*

A team of social scientists from the university, Kimball continued, remained in the community as consultants and observers for the 2-year study period. Their major working responsibility, he reported, was to give technical assistance in constructing a communitywide questionnaire and in the use of sampling techniques.

The university team, he said, avoided policymaking and leadership, but they sometimes raised questions or offered suggestions for smoother operation. Although community representatives were free to accept or reject their ideas, the social scientists, according to Kimball, took an active part in the project not only by providing technical skills but also by acting in the important role of catalysts.

Furthermore, he continued, they did so without impairing the basic responsibility of the community for its actions. When a community self-survey is well organized, he said, it can furnish enormously increased opportunities for the individual participation which is vital to the success of any group activity. The social scientist, Kimball remarked, may be able to further the process by stimulating isolated individuals and groups to work together on problems of mutual concern.

Pointing out that the town had 3 distinct social segments, he said that all of the planning and most of the activity were centered within the top third of the town's population although most of the problems considered were of equal or greater importance to the other two-thirds. The question of equalizing participation through all social classes remains unanswered.

## Can Change Attitudes, End Misunderstanding

Self-surveys are designed to transform individual goals to community goals by stimulating personal and community participation in public health activities, stated Charles P. Murphy, research associate, Health Information Foundation, New York City. Such surveys also provide the health worker with a means of testing the degree to which health programs are understood, appreciated, and utilized, Murphy said.

Conflicting attitudes toward common problems change when persons from different parts of the community work together and learn to

understand each other and the causes of their misunderstandings, Murphy stated. Also, he said, persons who lack the initiative to work alone are usually able to take constructive action on community problems when they serve on committees and work with groups.

Health action programs are most successful when they are initiated through existing institutions and in accordance with usual community procedures, Murphy said. The self-survey technique encourages acceptance of programs which run counter to community traditions and uses the desire and ability of members of a community to work together to solve their own problems. Timing of the program and selection of sponsors acceptable to the community are important, Murphy emphasized.

The probability of public support of a program is increased by self-surveys, Murphy concluded. Large segments of the community become personally involved and personally interested during the initiation, fact-finding, and planning stages of a public health program and develop a sense of personal responsibility toward the situation being studied, he said.

## *Suburbia and Public Health*

"Horse and buggy public health is not good enough to deal with the problems of suburbia," APHA President Hugh Leavell, M.D., Dr.P.H., said in concluding two half-day sessions participated in by public administrators, political scientists, historians, and business representatives, as well as public health leaders, on the topic, "The Impact of Suburbanization on Public Health."

"There must be understanding of the 'frontier fantasy' and of the objectives people have in going to live in suburban areas," Leavell said. "As they become migratory workers going into Central City in the morning and returning to their bedroom communities in the evening, we must understand the resulting changes in family structure and function and consider how our health advisory functions need to be adapted to the problem," he said.

"We need a child's 'bill of rights' as well as a GI bill of rights, since it seems likely that the child suffers more from being in suburbia than does his mother or father who usually have had the advantage of being brought up in areas where there were suitable cross-cultural influences and where they experienced the interdependency and neighborliness of a balanced community," Leavell concluded.

At the opening session, members of the APHA General Program Committee reported from a specially prepared analysis of the problem. Key facts given were:

The greater part of the population in this country is established in 168 "urban sprawl" areas. These areas occupy 7 percent of the land in the Nation. Suburban areas are growing in population at a rate greater than the central cities. But the central cities are still growing.

The "spill" of urban population has produced a complex web of interrelated issues affecting schools, mental health, drainage, water supply, transportation, hospital facilities, and sewage and garbage disposal.

The 77 standard metropolitan areas which have cities of 50,000 to 100,000 include almost 5,000 independent governmental jurisdictions. There are 16,210 units of local government in the 168 areas. Eleven have more than 250 units each.

Summing up the opening discussion, Abel Wolman, Dr.Eng., professor of sanitary engineering at Johns Hopkins University, attributed the process of suburbanization to uncritical developments of transit facilities, easy credit terms for automobile purchases, and the rise in population. At the root of the urban difficulty, he said, was the fact that private individual decisions conflict with the best of community plans.

The consequence of the failure of urban communities to plan for growth, Wolman stated, is the cultural and physical deterioration of the countryside.

Meanwhile, he said, the central core of the city, still holding the major share of the population, has its own drastic needs of housing, schooling, medical care, traffic facilities, accident prevention, and sanitation. These needs it must attempt to satisfy while its wealthiest and most influential community leaders desert the towns for rural retreats.

The second session of the symposium discussed remedial action for the cities which, said Victor Jones, Ph.D., professor of government at Wesleyan University, pursue three general policies:

1. Do nothing.

2. Organize each interest in a separate unit: water, school, sewerage, housing, traffic, and so on—a policy having the advantage of being an easy course but replacing territorial disintegration with functional disintegration.

3. Organize a regional government to weigh needs and resources and to share responsibilities with local units of government.

Jones warned that a regional authority, if it is not subject to popular control, may be unresponsive to popular needs and desires, and he suggested that a county government, properly organized, can do anything a regional authority can do. He also supported the proposition that services necessary for the well-being of the whole community need not be self-supporting on a fee, license, or special tax basis, but would warrant

financial support out of general tax revenues.

In suggesting guidelines for urban management, Leona Baumgartner, M.D., Ph.D., commissioner of health, New York City, observed that economies may be realized by rehabilitating the neighborhoods and lives of that 6 percent of the so-called problem families which consume more than half of public welfare services.

Dwight Metzler, chief engineer, Kansas State Board of Health, recommended economies by organizing sanitary districts for management of water and sewer facilities.

Leroy Elwell of the Pennsylvania Economy League described the operation of the Pittsburgh-Allegheny County plan.

Paul Lemkau, M.D., and Ruth Freeman, Ed.D., of the Johns Hopkins School of Hygiene and Public Health, discussed the sociological and psychological implications of stratifying American neighborhoods according to income level, occupation, or ancestry.

Howard Ennes, M.P.H., director, bureau of public health, Equitable Life Assurance Society, chaired the panel.

Participants included, in addition to those named above:

Marvin Rapp, New York State College for Teachers, Buffalo; A. Holly Patterson, LL.B., County Executive, Nassau County, Mineola, N. Y.; Dorothy Nyswander, Ph.D., University of California School of Public Health; Granville W. Larimore, M.D., M.P.H., New York State Department of Health; Berwyn F. Mattison, M.D., commissioner of health, Erie County Health Department, Buffalo; William C. Spring, Columbia University School of Public Health; and Roscoe P. Kandle, M.D., deputy commissioner of health, New York City.

# Laboratory Grants and Research...

*The State and local laboratory areas of performance, their relationships, and their eligibility for PHS research grants are the subjects of three of the papers in this section. Research offerings include a test for identifying pathogenic fungi in sputum, a refined trichinosis test, improved microscopes, and the findings that streptococcal infection is spread mainly by direct contact, and that persons infected with Mycobacterium leprae react specifically to the standard tests for syphilis. Lowered skin resistance is suggested as an etiological factor in fungus infection of the feet.*

## Laboratory Can Do Much To Assist Others

Some public health services from State laboratories reach residents of all areas, and people in isolated localities depend on them almost completely, according to Howard L. Bodily, Ph.D., chief, division of laboratories, California State Department of Health. This, he said, is a natural result of a division of activities by type of service and geographic boundary between State and local public health organizations.

Specific activities have been assigned to State and local organizations according to a variety of systems, he said, but the first part of his discussion on the relationships between State and local public health laboratories was limited to the situation in California.

### *Direct Services*

Tests performed by that State laboratory in one area of public health activity—direct services to physicians and health departments—vary with the size and facilities of local organizations. But in general, Bodily reported, they include virology, mycology, and parasitology examinations. The State also provides the tests most logically centralized in one laboratory, such as enteric phage and sero typing, food and drug examinations, and specific identification of problem cultures.

The local California laboratories, said Bodily, perform general serologic and bacteriological tests and give examinations the State cannot conveniently provide because of transportation and related problems.

### *Other Services*

Only a few State laboratories, according to Bodily, engage in biological production. Their standardization of biologicals is more important and often consists in evaluating various products and sending test results to local laboratories and manufacturers.

The extent of research programs varies widely among State laboratories, he continued, but most of them are in a position to search for new techniques and evaluate those which are proposed. He said research was well suited to the general consultive character of most State organizations and recommended the aid and encouragement of increased research activity at the local level.

Many States have an evaluation and approval program for their local organizations, Bodily reported. In some cases, it is only for 1 or 2 procedures. In others, it covers every phase of laboratory work and includes certification of personnel. These procedures benefit the State laboratories, he continued, by showing them how much confidence to place in work done at the local level, while public health personnel scat-

tered through the State can in the same way be assured of support by the central organization.

Training programs for inservice and newly recruited personnel should be a State responsibility, according to Bodily, but local participation is also necessary. In California, he said, State and local officials have worked together to plan institutes which were originally for training purposes, but during the past 5 years have become combination training and problem-solving conferences.

## Research Grants Program Explained to Scientists

State and provincial public health laboratory scientists are eligible for Public Health Service research grants on the same competitive basis as scientists in any non-Federal university, hospital, or other research institution, Kenneth M. Endicott, M.D., scientific director of the Division of Research Grants, National Institutes of Health, explained in reviewing the program for the benefit of public health laboratory directors.

Currently, there are 10 projects totaling $82,026 in 7 State and provincial laboratories. During the 8 years of the program, many grants have been made to such laboratories. Application may be made to the Division of Research Grants, National Institutes of Health, for a grant to cover costs of additional personnel, permanent equipment, supplies, travel, and other expenses necessary for the proper conduct of a research project.

Discussing the philosophy of the research grants program, Endicott pointed out that the Public Health Service depends upon the scientists to seek support for the work they wish to do, rather than compiling lists of projects and then trying to persuade scientists to undertake them. Any topic related to health, from basic biochemistry to the treatment of a specific disease, from stream pollution to morbidity statistics, may be the subject of a research grant, he said.

### *Processing of Applications*

Endicott outlined the processing of applications for research grants as follows:

1. The application is reviewed by the appropriate 1 of the 17 study sections of the Division of Research Grants. This group considers such factors as the importance of the problem, the adequacy of the experimental design, the ability of the investigator, and the type of facilities available to him. It then recommends approval or disapproval and assigns a priority rating based on the merits of the proposal.

2. The application is reviewed by 1 of the 7 national advisory councils of the National Institutes of Health. The council considers the proposal primarily from the standpoint of policy, relying heavily upon the study sections for technical evaluation, and recommends appropriate action to the Surgeon General of the Public Health Service. The Surgeon General has the final authority for awarding the grants, but he may award only those recommended for approval by one of the advisory councils.

The study sections, which make the first review, are panels of non-Government scientists selected for special competence in one of the various fields of health, medicine, and related sciences, whereas the national advisory councils are composed of both scientists and laymen.

3. If the application successfully passes the study section and council review and if funds are available, the applicant and his institution are notified that a grant for 1 year will be made. A check is forwarded to the financial officer of the scientist's institution, and it becomes the responsibility of the institution to administer the funds under its own rules and regulations. In many cases, the applicant is informed that if funds are available he may receive support for his project at a stated level for 1 to 4 additional years.

Endicott pointed out that the scientist is free to modify his research plans as the work progresses and to publish his results as he sees fit without clearance from the Public Health Service.

## Direct Contact Is Indicted In Streptococcal Infections

Direct contact with persons harboring streptococci was reported as apparently the important means of spreading streptococcal infections. And individuals who have recently acquired such infections and persons who have large numbers of streptococci in the upper respiratory tract or who have the organisms in both the nose and throat are most likely to be "carriers."

These are the results of a study of the method of spread of respiratory infections in a military population, made by the Francis E. Warren Air Force Base, Cheyenne, Wyo., and the department of preventive medicine, Western Reserve University.

The study was reported by Lewis W. Wannamaker, M.D., assistant professor of pediatrics, University of Minnesota, Floyd W. Denny, Jr., M.D., assistant professor of pediatrics, Vanderbilt University, both formerly assistant directors of the streptococcal disease laboratory, Warren Air Force Base, Charles H. Rammelkamp, Jr., M.D., present director of the laboratory, William D. Perry, M.D., Alan C. Siegel, M.D., and Harold B. Houser, M.D., assistant professor of medicine, State University of New York.

Risk of infection may be minimized by avoidance of crowding, Wannamaker and his co-workers said. Distance between the beds of susceptible individuals and the beds of persons harboring streptococci was found to be "crucial" in preventing spread of infection in the barracks population studied.

Indirect contact with pathogenic streptococci in the air or on contami-

nated articles in the environment does not ordinarily result in infection. Exposure to blankets harboring large numbers of streptococci resulted in no more infections among the men than the use of blankets known to be free of the organisms.

No effective vaccine against streptococcal infections is currently available, and such a vaccine will be difficult to develop, according to Wannamaker and his associates. They said evidence indicates that in human beings infection with one type of streptococci produces immunity to that type only, and the individual remains susceptible to all other types of the organism. Since 40 or more types of streptococci have been identified as pathogenic to man, a successful antistreptococcal vaccine would have to be effective against each one.

## Local Laboratories Ask More State Recognition

How do city and county laboratories grade their working relationships with State public health department laboratories?

Generally, the 33 respondents to a questionnaire sent by William A. Dorsey, chief of public health laboratories, Richmond (Va.) Department of Public Health, gave a good rating to State cooperation.

Many of the respondents, however, indicated areas in which State and local laboratory relationships could be improved, Dorsey reported. Running through the recommendations, he said, was the plea that State laboratories give more recognition to the importance of municipal and county laboratory work.

The questionnaire was sent to 44 city and county health laboratories in 34 States from coast to coast to get a representative sample of local-State relationships. Of the 33 respondents, 7 county and 8 city laboratories were either partially or totally under State control, while 1 county and 17 city laboratories were completely independent, Dorsey said.

Dorsey directed attention to the trend toward urbanization. There are currently 152 municipal, 73 county, and 32 city-county laboratory units serving population groups ranging from 30,000 to 8½ million, he said.

### *Recommendations*

Dorsey reported the following recommendations made by local laboratory directors for closer cooperation and thereby improved public service:

Seven local laboratory directors stated more visits from the State laboratory director or his staff would help them do a better job and keep them up to date on newer procedures.

Three laboratory directors reported they had not been properly notified about State health department changes of policy or procedure. Four other local directors stated they would appreciate a greater part in the formulation of policy. Cited was the difference between the urban problems of municipal laboratory directors and those in rural sections served by the State health department.

Delineating the policy status of the local laboratories were the answers to the question: Do you have any part in formulating laboratory policies on the State level? Twenty-three local directors answered no. Four reported limited access to policy decisions by direct suggestion. Six laboratories reported that they had a part in formulating policy, usually through an organization.

Two of the directors reported they would like more evaluation by the State laboratory. Thirty-two of the respondents said their laboratories were now evaluated. Milk examinations and serologic tests for syphilis were reported as the types of evaluations most frequently made, although 12 stated that certain bacteriological evaluations were included.

Four directors suggested that closer coordination with the State laboratory would assist in the training of personnel and in improving the standards of local laboratory workers. Only 7 of the respondents answered yes to the question: Is the State health department responsible for certifying your personnel?

A number of independent local laboratories commented that much of their laboratory work was supported entirely by local municipal funds. They pointed out that while State laboratories received financial assistance from State and Federal funds, very little was channeled to the local level.

### *Statewide Organization*

Summing up, Dorsey said closer coordination between State and local laboratories would help solve problems of policy and changes in procedure. It would funnel down information about newer developments and give the local units aid in the work they cannot accomplish for themselves.

A statewide organization for public health laboratory directors, similar to the National Conference for State and Provincial Laboratory Directors, might prove an excellent vehicle for keeping the local units better informed and giving them some part in contemplated changes in policies and procedures, he concluded.

## Outlines Test of Sputum For Pathogenic Fungi

The differential laboratory diagnosis of pulmonary disease has become increasingly important since the advent of antibacterial agents for the treatment of tuberculosis, said Joseph M. Kurung, senior medical technician, Ray Brook State Tuberculosis Hospital, Ray Brook, N. Y. Lung infections due to pathogenic fungi are not common, he continued, but consideration of such infection is necessary in every obscure and undiagnosed pulmonary disease.

Discussing isolation and identification of pathogenic fungi from sputum, Kurung outlined details for collection of the material.

### *Preliminary Steps*

Sputum should be obtained early in the morning and should come directly from the lungs. Saliva and nasopharyngeal secretions should be avoided.

The sputum should be carefully examined with a hand lens for the presence of the yellow or gray *Actinomyces* granules. Stained and unstained preparations of the tiny particles should then be examined microscopically.

The particles or other specimens of sputum for this examination should be placed on a glass slide and mixed thoroughly with one or two drops of 10 percent sodium hydroxide. A glass cover is then placed over the preparation and, after 3 to 5 minutes, it can be examined under subdued light for fungi.

### *Sputum Cultures*

The identification of fungi, except for *Actinomyces bovis*, *Blastomyces*, and *Coccidioides*, is difficult by direct examination of sputum, Kurung said. In all cases, diagnosis should be confirmed by cultural methods. Typical cultural and morphological fungus characteristics, he stated, are best demonstrated by the simultaneous use of brain-heart infusion blood agar and Sabouraud's glucose agar media.

The first culture medium is prepared by adding 10 ml. of blood, 2,000 units of penicillin, and 4,000 mcg. of streptomycin to each 100 ml. of Bacto brain-heart infusion containing 2 percent agar. Streak a generous loopful of purulent sputum over the plates' surface, seal the plates with wide rubber bands to prevent drying of the medium. Two blood agar plates are incubated at 37° C., and two blood agar plates and the two Sabouraud's plates at room temperature. If actinomycosis is suspected, anaerobic cultures on brain-heart blood agar without the addition of the antibiotics should also be made.

If periodic examination shows that the plates are negative, they can be discarded after 4 weeks of incubation.

### *Identification*

The pathogenic fungi, Kurung continued, are markedly different in appearance, both culturally and microscopically. Recovered colonies may be smooth or rough or cottony and filamentous with abundant aerial hyphae. Microscopic examination, he said, should be made of an unstained slide preparation from the colony.

Fungus identification, said Kurung, is based on the type of colony recovered, the appearance and location of spores, the presence, size, and shape of yeastlike budding cells, and the presence of arthrospores and chlamydospores.

## Hansen's Disease Patients React to STS Antigens

Serologic tests of persons infected with *Mycobacterium leprae* may provide a valuable indication of the specificity of the lipid antigens used in standard tests for syphilis, according to John F. Kent, Ph.D., chief, and Robert E. Harrigan, department of serology, Army Medical Service Graduate School, Washington, D. C., and A. Garcia Otero, M.D., Havana, Cuba.

Kent and his associates reported results of a study of 34 native Cubans infected with *M. leprae*. None of these patients showed either clinical or anamnestic signs of treponematosis, and all of them were negative for treponemal immobilizing antibodies.

The eight serologic tests for syphilis used in the study included flocculation and complement fixation tests, and if a serum reacted to one or more of the tests, the degree of reaction was determined quantitatively, Kent and his co-workers said. They stated that ordinary extracts of beef heart used as antigen produced the greatest number and the strongest reactions, whereas cardiolipin antigens produced a relatively low but variable frequency of "false" reactions. Fifty percent of the persons examined reacted to the Kahn standard test; only 12 percent reacted to the Army Medical Department's cardiolipin complement fixation test.

## Report the Refinement Of Trichinosis Test

Refinements of a complement fixation test for trichinosis, reported by Victor N. Tompkins, M.D., and Thelma Muraschi, B.S., of the division of laboratories and research, New York State Department of Health, produce highly specific reactions and permit early detection of infection. Reaction persists only 6 to 18 months following infection.

Three types of tests for trichinosis depend upon reactions with humoral antibodies which develop during the course of *Trichinella spiralis* infection in man. Known as skin, precipitin, and complement fixation tests, their relative merit has been moot. With all of these tests, laboratory workers have encountered nonspecific results from cases known to be infected.

Using an antigen improved by Witebsky, Wels, and Heide, several investigators had found that the complement fixation test of human serums had excellent specificity and greater sensitivity than skin or precipitin tests. Nevertheless, the test continued to fail to induce a reaction from serums of certain patients known to be infected. Tompkins and Muraschi sought to reduce such failures by improvements in the technique of testing.

Three technical factors were found to influence the sensitivity of the test after many failures resulted from the use of an antigen level which had produced a maximum reaction from a single patient. One factor was that

undiluted serum often inhibits a reaction. It was recommended that serum should be tested not only undiluted but also in saline dilution 1 : 5 for this test.

The amount of antigen was the second factor. It was recommended that a wide range of antigen dosage be applied not only to establish maximum reaction but to detect reaction at all. Examinations of serums from more than 30 patients indicated that no single amount of antigen will detect reaction, whatever the concentration of the complement, but that three amounts can be expected to detect all reactions. The experience indicated the use of dilutions of 1 : 8, 1 : 64, and 1 : 128 in the presence of three units of complement.

The third factor was the amount of complement. Three instead of six units of complement increased sensitivity and in some instances allowed earlier diagnosis.

Reactions have been observed as soon as the first week of symptoms. In most instances, specimens collected between the 16th and 21st days of illness are the first to react. Reaction from one asymptomatic patient, however, was not obtained until 8 weeks had passed. Titer rises rapidly at first, reaches its maximum in the second or third month, then slowly declines.

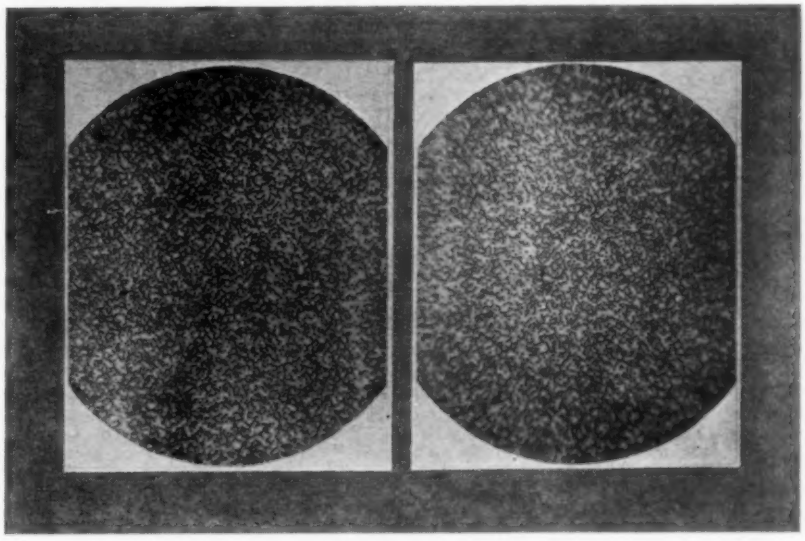
## Discusses Improvements In Microscope Design

Although microscope design has been considered comparatively stable, significant improvements in mechanical and optical design have been made in recent years, according to James R. Benford, head, visual instruments department, Bausch and Lomb Optical Company. More improvements are indicated in the near future, he added.

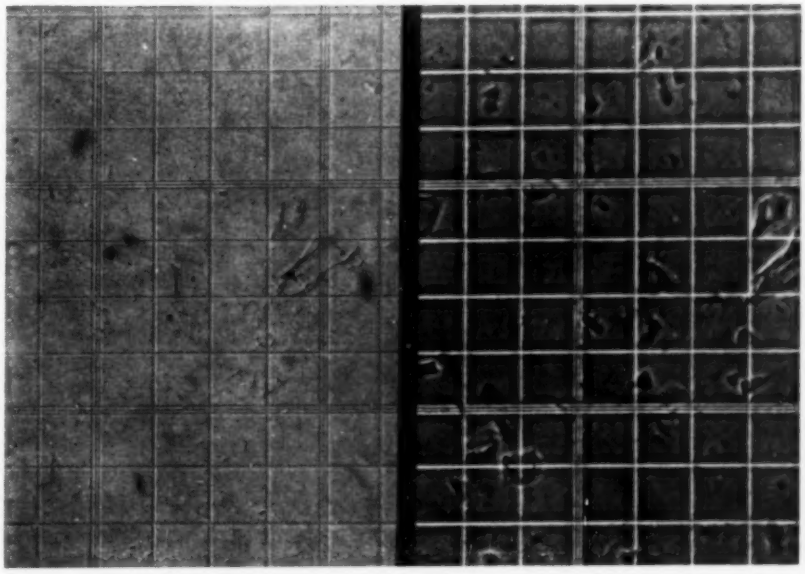
The mechanical design is often the deciding factor in the performance of a microscope in doing a given job, he said. Within the last few years the standard microscope has been improved in stability, in durability, in manufacturability, and in convenience of operation, he reported.

The use of ball bearings in the adjustment mechanisms of microscopes provides frictionless fine adjustment accurate to within a small fraction of a thousandth of an inch, he claimed, and greatly prolongs trouble-free durability of the mechanisms.

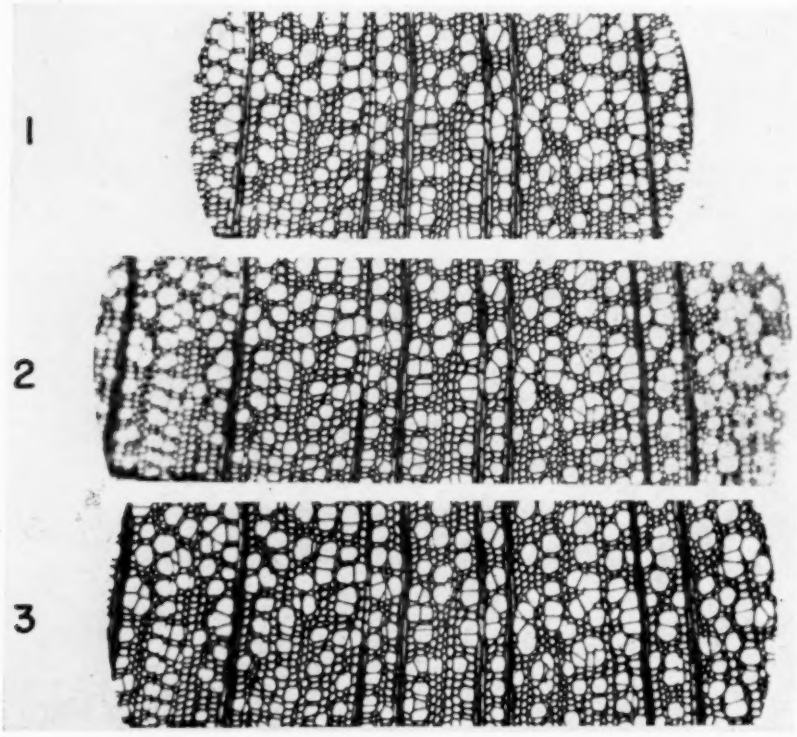
The introduction of phase microscopy, improved design of microscope eyepieces, and new instrumentation for ultraviolet microscopy are examples of improvement in optical design, Benford said.



**Improvement in field coverage made possible by newly designed eyepiece using high index glass.**



**Comparison between a bright field image (left) and a phase contrast image of mineral dust particles.**




**Comparison of microphotographs taken using: 1—ampliplan; 2—huygens; 3—ultraplane.**

The accompanying microphotos show the improvements in optical performance discussed by Benford.

## Lowered Skin Resistance May Cause Athlete's Foot

Recent experimental studies at New York University indicate that lowered resistance of the skin to pathogenic fungi already present, not exogenous exposure to the organisms, is responsible for most acute attacks of fungus infection of the feet.

The study group declared that the commonly accepted measures for preventing the disease—isolating infected persons, using antiseptic foot baths, sterilizing contaminated articles—could therefore well be discarded.

Presenting the findings of the studies were Rudolf L. Baer, M.D., associate professor of clinical dermatology and syphilology; Stanley A. Rosenthal, Ph.D., assistant in microbiology; Jerome Z. Litt, M.D.; and Hyman Rogachefsky, M.D., all with the skin and cancer unit, New York University Post-Graduate Medical School.

Unsuccessful were attempts to produce fungus infection in persons free from the disease by exposure to contaminated foot baths, they specified. Not one of 45 persons so far tested developed clinical fungus disease or showed any other gross changes during a 6-week period after exposure, although fungi were found microscopically or in culture one or more times on the feet of 27 persons.

### *Study Conditions*

The experimental conditions of exposure, they pointed out, were probably more favorable to development of tinea pedis than natural conditions. Each person immersed one foot for 30 minutes in water containing fungi. For 14 persons, water in which persons with proved fungus infection had soaked their feet was used. For the other 31, the water was deliberately contaminated with viable fungi obtained from culture tubes.

These studies have also shown that the micro-organisms are easily transmitted from one foot to another, even in the absence of any fungus disease, they stated. Of 23 persons who showed mycelia on their exposed foot, 15 also showed mycelia on the unexposed foot.

Other studies have demonstrated that pathogenic fungi are readily shed from the feet of persons with and without clinical or laboratory evidence of infection, Baer and his associates reported.

### *Supports Clinical Data*

The findings of these studies, they remarked, support previously existing clinical data that exogenous exposure to fungi in swimming pools, shower stalls, bathrooms, and similar places plays a negligible role in eliciting acute attacks of fungus infection of the feet. It is their belief that the decreased resistance of the skin of the human host, with a resultant activation of pathogenic fungi previously lying dormant, is responsible for such attacks.

In view of this conclusion, they stated that some of the conventional measures for preventing fungus infection of the feet were useless. They suggested the following simple procedures be used to maintain and raise the resistance of the skin:

1. Wear perforated shoes whenever possible, especially during the hot part of the year.

2. Wear wool or cotton socks, which can absorb moisture.

3. Use a drying, mildly fungistatic foot powder or one of the fatty-acid containing powders.

4. Dry feet carefully and change to dry footgear whenever shoes and socks become "soaked."

They also suggested the use of nonalkaline soapless detergents for washing feet as a "logical measure," even though it has not yet been proved.

# International Health Programs . . .

*In a series of reports and vignettes, the Director General of the World Health Organization, the United States Assistant Secretary of State, and public health workers who have participated in WHO or United States assisted programs discuss the values of these programs for our Nation and for all countries of the world.*

## Director-General of WHO Cites Benefits and Costs

How does the United States benefit from the work of the World Health Organization? Since the United States has its own bilateral health programs, why is WHO necessary? How much does the work of WHO cost a citizen of this country?

Recognizing the need for mobilizing the sympathy and support of an ever-increasing number of people in all countries for the aims of WHO, M. G. Candau, M.D., its Director-General, provided answers to these questions.

Aside from the humanitarian aspects of the work of the World Health Organization, its public health programs yield cash dividends that are shared not only nationally but internationally, Candau pointed out in discussing how the United States benefits. He noted, for example, that the malaria control program in India has an economic value estimated at around $5 billion, a sum equal to about a quarter of the country's 1949 national income. To the United States businessman, this represents money available for spending on the goods and services which he can provide, he said.

Summarizing his discussion of the United States stake in world health activities, the WHO Director-General stated: "If it is true that in this shrunken world of ours the prosperity of your country is intimately linked with that of the rest of the world, then you have no choice but to use all means in your power to help raise the health standards in the economically weak regions, since disease and poor health are among the main obstacles to their social and economic development."

### *Programs Affecting All Countries*

In explaining the need for the World Health Organization, Candau pointed out that there are many types of activities essential for safeguarding the health of citizens of all countries that can be carried out successfully only on a worldwide basis. He named as the best example the International Sanitary Regulations adopted by WHO. These regulations will not only provide maximum protection against epidemic diseases, he said, but they will also do away with most of the quarantine handicaps imposed in the past upon the freedom of travelers and will promote international trade and commerce by reducing delays in international freight transport.

Candau also maintained that the WHO activities and the United States bilateral health programs are complementary. The latter, he said, are aimed primarily at satisfying immediate needs and are set up for a fixed period of time; whereas, WHO's interest and participation in international health programs is permanent. It is, therefore, in the interests of all that whatever remains to be done once bilateral programs are completed should be continued through the permanent facilities of WHO, he declared.

The cost to each United States citizen for a year's work by the hundreds of health workers in the field and by the personnel at the Geneva headquarters and the six regional offices of the World Health Organization is slightly more than 2 cents, Candau reported. In conclusion, he said to the citizens of this country: "I believe that in helping the World Health Organization to carry out the great tasks which it has only just begun to undertake, you will be fulfilling the responsibilities you feel you have, both to your own country and to the world."

## Psychological Contributions Of WHO Are Fundamental

More fundamental in the long run than the economic contributions of the World Health Organization are its psychological, or spiritual, contributions, avowed Assistant Secretary of State David McKendree Key.

By helping to make possible effective communication among people of various nations, just as surely as through its material achievements, the WHO is helping gradually to reduce tensions which could explode into war, Key declared, explaining that by communication he meant the man-to-man exchange of ideas and the accommodation of differences.

Key pointed out that the 700 health experts from 50 countries who make up the WHO staff are sharing common tasks and common interests and are working toward common objectives. Thus, he said, they are learning to understand each other's viewpoints and to live harmoniously in a world which technology has shrunk so that we are all neighbors. Moreover, the WHO technicians are becoming acquainted with the people they are helping and are identifying them-

## "Mr. Who" Comes to Thailand

"I cannot resist telling an amusing but pertinent story about the World Health Organization, which is known in many parts of the world as WHO. An Indian doctor working on malaria control in a remote village in northern Thailand asked the local headman a few questions: Had he heard of Mr. Nehru? 'No' was the answer. Had he heard of President Eisenhower? 'No.' Had he heard of the UN? Again, 'no.' Had he heard of WHO? 'Oh, yes,' the man replied, 'Mr. Who is the man who sprayed my house, and we have had no more sick babies—a very good man.' "

—David McKendree Key

selves with the needs of these people, he added.

As for the people receiving WHO assistance, they are discovering that cooperative international action can achieve tangible benefits for them in their own lives, Key explained. They are discovering also, sometimes for the first time, that they themselves can actively participate in measures to improve their conditions. Apparently insignificant events, such as a mother taking her child to a rural health center or a village population working together to construct a sanitary well, often represent a new awakening of individual and community initiative, he said.

### *Democratic Principles*

Not only in its activities is the WHO helping to promote democratic ways of life but also in its organizational structure, the Assistant Secretary noted. In this respect, he stressed WHO's use of regional offices and regional committees, which, he said, enable it to be particularly responsive to the wishes and needs of member states.

Key outlined the procedure as follows: First, nations discuss with the regional office staffs their needs for various types of WHO assistance. Then, regional committees meet to discuss health needs and to review a health program for their areas. Only after this regional review are the programs submitted to WHO headquarters for integration into an overall annual program and for final approval or modification by the annual world health assembly.

## WHO Consultant Recounts Experience Overseas

"The most impressive person I met in Yugoslavia was . . . a health officer whose area was in a difficult terrain and whose people suffered because their diet was deficient in protein. With a reformer's zeal and a diplomat's finesse, he had persuaded his people to dam up a stream to build a small lake, not for hydroelectric power, but to grow fish."

This was one of the incidents related by Paul V. Lemkau, M.D., associate professor of public health administration, Johns Hopkins University School of Hygiene and Public Health, in an informal report on his 6-week tour of Yugoslavia in 1951 as consultant for the World Health Organization.

The pervading topic of discussion as the consultants and their Yugoslavian hosts traveled over the rough and winding roads of the country, particularly in Serbia, Bosnia, and Macedonia, Lemkau recalled, was the condition of the toilets. They usually wouldn't work at all and were far more unsanitary than pit privies, he said. One of the Yugoslavians advocated an educational program to get the situation improved, while another contended that a law should be passed, thus provoking the basic philosophic argument of force versus education, the WHO consultant noted.

At the end of World War II, Yugoslavia directed its attention to social reform, particularly toward improving the care of children, Lemkau said, noting the prevalence of institutions for children, from nursery schools for children of working mothers to institutions for adolescents. The specialized but briefly trained teachers called defectologists seemed, for the most part, to be doing good work, he said. Foster care was just beginning to be tried out, and the workers using it were enthusiastic about the early results.

### *Observations in Japan*

From a similar tour in Japan in 1953, Lemkau reported that in general the Japanese had much knowledge but that they tended not to use it because of lack of funds or, sometimes, because the knowledge was not associated with a real drive to change things. For example, he said, everyone seemed to know that fever was no longer really needed for the treatment of paresis; yet it was almost universally used. Perhaps the fever boxes were so hard to get, Lemkau suggested, and so costly that the Japanese did not want to give them up.

## Disease Control Efforts Prove Effective

The work the World Health Organization has done in bringing order out of the chaos of international quarantine was cited as one of its noteworthy achievements by Arthur S. Osborne, M.D., international health representative of the Public Health Service.

Together with its system for disseminating epidemiological information, the International Sanitary

Regulations of the WHO have set up an almost impervious barrier against the importation into this country of the so-called convention diseases, Osborne specified.

As an example of the value to the United States of WHO's reporting system, he mentioned its effectiveness in connection with the recent occurrence in Trinidad of the first cases of urban yellow fever in 20 years. Pointing out that one-third of the United States is a yellow fever receptive area, he said that the reporting system has given us time to set in motion the machinery necessary to exclude the disease.

### *Rabies Control Efforts*

Osborne cited rabies as one of the diseases which shows the effect of action among the community of nations making up WHO. More dramatic even than the mass vaccination campaigns, he said, is the announcement of the result of the study sponsored by the WHO on the use of hyperimmune serum. There is now evidence that this material, which is used in conjunction with vaccine, will confer immediate passive immunity that will protect a person exposed to rabies until an active immunity is built up by the vaccine.

Rabies, endemic throughout the world except in certain limited areas, has been no small problem to the United States, particularly in the southwestern States since the disease is hyperendemic in Mexico, Osborne noted.

Concerning mass vaccination campaigns, he mentioned the field tests of avianized rabies vaccine in Israel and Malaya, where the disease in its enzootic form has been a serious problem. In Israel, after 3 years of mass vaccination of dogs, only five cases of rabies in animals were reported in 1953. In Malaya in August 1952, just before the start of the mass immunization program, there were 41 cases of laboratory confirmed rabies; by June 1953, the disease had disappeared from the country.

In Mexico, an intensive antirabies program has resulted in a drop from 37 human cases in 1952 to 4 in the first 7 months of 1954, he said. A similar reduction is apparent in the United States, the number of cases dropping from 21 in 1952 to 5 in the first 9 months of this year.

Osborne also mentioned the WHO work on controlling traffic of addiction-producing drugs, the standardization of biologicals, and the International Pharmacopoeia as part of the measurable benefits the United States has received from its participation in WHO.

## Indonesians Receptive To Health Program

Widespread information about health problems and a universal desire for better health services were found by John C. Hume, M.D., Dr.P.H., in Indonesia when he visited the country early in 1954. He believes it inevitable that the country will attain a high level of health services, given only time, moderate assistance, and freedom from war.

Dr. Hume, associate professor of public health administration and assistant director, Johns Hopkins University School of Hygiene and Public Health, was in Indonesia as a World Health Organization consultant. His major assignment was to review the yaws eradication project. This project, he said, is only one of many health programs in the country and one of several joint ventures of the national government and the World Health Organization.

A tour of the island of Madura in the company of its regent and vice regent enabled Hume to observe how deeply interested Indonesia's civil leaders are in health problems and programs. Not only did they have a detailed knowledge of the yaws eradication program—of how much work had been done and of how much remained to be done in their regency—but they had good general information about the disease itself. Moreover, they had an intelligent grasp of the health problems facing Madura, in terms of both specific diseases and the difficulties posed by shortages of trained personnel. The leaders expressed to Hume their interest in broadening the health programs and in raising the level of general medical and public health practice.

A major problem in Indonesia, with its 80 million people scattered over some 2,000 islands, is that of transporting men, equipment, and supplies from one island to another, Hume pointed out. That the task of providing health services in this country is an enormous one is demonstrated, he said, by the fact that in 4 years, the yaws eradication program has been able to reach only about 15 percent of the people.

### *Combating Yaws in Haiti*

Although Haiti has social, economic, and health problems comparable to those of Indonesia, it has made considerably greater progress in combating the problem of yaws, according to Hume's report. Since the yaws eradication project began in February 1951, almost all the country's 3½ million people have received treatment, and, according to the latest estimates, the percentage of the population demonstrating lesions of yaws has dropped from about 15 to less than 0.03, he announced. He served as a WHO consultant in Haiti for 2- to 6-week periods during each of the past four summers.

The dramatic results of the program are apparent to all the population. "The news travels far and wide by word of mouth and probably by drums as well. In the early days of the campaign, it was not unusual to see persons crippled with crab yaws who had hobbled 30 to 40 miles to receive a penicillin injection. More difficulty was encountered in preventing persons from moving along with the treatment teams and receiving therapy in successive villages than in persuading reluctant

individuals to receive treatment," Hume said.

Commenting on the future of public health work in Haiti, Hume reported that the health authorities are planning a broadened program and that the citizens are eagerly awaiting the new services. New programs must, of course, come gradually, as financial limitations and shortages of public health personnel permit, he noted.

## Overseas Health Programs Sow Seeds of Democracy

In helping to raise social and economic standards in the underdeveloped areas of the world, public health can be used to prevent communism from taking root and can strike at its most vulnerable point, according to John A. Logan, Sc.D. chairman, department of civil engineering, Northwestern University Technological Institute.

Logan warned that the United States could lose leadership in the practical application of technology in the undeveloped areas, unless planning is unified and the need for cooperation with local communities is more appreciated.

Public health workers have served for more than a century as a "social conscience" with regard to the improvement of health and sanitation in the United States. They must now apply the same approach to the world, he said.

Logan suggested that a key to the future success of our overseas development program lies in the willingness of health officials to work with nonprofessional groups and to accept leadership in the broad field of development. He pointed out that this is of particular importance to the health engineer because of the contribution that the engineer can make overseas to environmental sanitation. Likewise, engineering training gives the engineer special competence in the collection and impartial evaluation of data and opens opportunities for leadership.

### *Community Development*

Logan pointed out that this country has developed technical competence in the field of regional planning. He cited the Tennessee Valley Authority as an example. He urged greater knowledge of multipurpose community improvement, which he termed "the keystone to successful large-scale foreign operations."

As known today, the community development concept evolved in China from the mass education movement of the 1930's from which came sufficient experience to establish the following basic needs, which Logan expressed as the principles of self-help:

The need for regionalization—the incorporation of groups of communities within a rational administrative unit.

The necessity for community or village committees and voluntary workers as the basis of the self-help movement.

The need for a multipurpose approach—although an important objective of development is self-sufficiency in food production, it is now recognized that increased agricultural production cannot be brought about on any important scale unless the twin obstacles of disease and ignorance are simultaneously attacked.

The necessity of providing priorities with regard to the objectives of development, usually beginning with the satisfaction of "felt" needs.

The necessity for the removal of the economic and social obstacles to the dignity and development of the individual, including such factors as cultural prejudice and the feudal barriers to the ownership of land.

"Community development should not be looked upon as a specialized branch of any particular government department," Logan added, emphasizing that regardless of how this fundamental technique of development is administered it should provide an integration of all departmental interests at the village level.

"The active participation of local people in their own betterment not only alters the attitude toward development from that of an imported foreign procedure to something understood and appreciated, but it directly utilizes one of the most important capital resources of the underdeveloped areas, the productive capacity of the population," he noted.

## WHO and United States Cooperate in Iran

The bilateral programs of the United States can create a greater impact with their greater financial resources and through their more direct relationship with host governments, but the multilateral approach of the World Health Organization is really the long-range approach to technical assistance, declared Emil E. Palmquist, M.D., M.P.H., who served as chief of the public health division of the United States Operations Mission to Iran from 1951 to 1953. He is now assistant chief, Division of International Health, Public Health Service.

Palmquist gave several examples of the close working relationship established in Iran between the United States mission and WHO personnel. One was the malaria control program, which was guided by a malaria control commission made up of representatives from the Iranian Ministry of Health, the School of Medical Sciences of the University of Teheran, a WHO advisory unit, and the United States mission. Another was a tuberculosis control demonstration center, for which WHO provided seven technicians and the United States mission supplied administrative services and some of the equipment.

Describing briefly some of the public health activities under way in this

country, Palmquist emphasized the malaria control program, which he said has produced spectacular results. In the Caspian Sea area, for example, the incidence of malaria dropped from 90 percent in 1949 to 9 percent by the end of 1953, he reported.

Other programs mentioned included an extensive environmental sanitation program; demonstration health centers, which emphasize the training of sanitarians and women health visitor-midwives; programs involving acute communicable disease, trachoma, tuberculosis, and venereal disease; and an extensive health education program.

## Technical Aid to Vietnam Stimulated Local Action

Speaking from his 2 years' experience with the United States technical assistance program in North Vietnam, Warren Winkelstein, Jr., M.D., M.P.H., declared that the program has led to improved public health operations in that country not so much through the provision of any specific technique as through the stimulation of action and the exchange of ideas. He considered particularly important the help given local personnel in developing confidence in their own capacities.

Dr. Winkelstein, now director of the division of communicable disease control, Erie County (N. Y.) Health Department, was regional representative for North Vietnam of the public health division, United States Special Technical and Economic Mission to Indochina, from 1951 to 1953.

The relationship of the foreign technician to the local health worker was early recognized as one of the problems to be met in this country, Winkelstein reported. It was necessary to establish confidence on the part of the local officials in the fact that there were no strings attached to the technical aid, he said. It was necessary further, he specified, to help the health department leaders develop enough confidence so that they could undertake activities of a scope not previously envisioned and so that they could sustain ordinary failures without losing perspective.

Winkelstein attributed the local health personnel's reluctance to proceed with programs and their emphasis on the need for material aid to the fact that responsibility for activities was comparatively new to them. They therefore clung tenaciously to tangible objects and were afraid to venture into actions results of which were not entirely predictable, he contended.

### *Health Problems and Programs*

Discussing the conditions in North Vietnam at the beginning of the technical assistance program, Winkelstein noted that outside the cities of Hanoi and Haiphong there were only 3 or 4 physicians and that there was an almost complete lack of medical facilities in the rural areas where most of the people lived. He listed as the major health problems trachoma, smallpox, infant mortality, gastrointestinal diseases, malaria, and tuberculosis.

A field program for the treatment of trachoma and a village dispensary program were two of the United States assisted projects that Winkelstein described. The latter program, which he thought was perhaps unique, involved the provision of a kit of drugs and medical supplies to any village that would send a local person to a training institute for 2 weeks, would furnish a suitable location for the dispensary, and would make the treatment available to the people without charge. More than 1,000 villages established these dispensaries, he reported.

# Programs in Dental Health . . .

*Emphasis on dental care for children; the use of educational techniques; and clinical research in such fields as oral pathology, periodontal disease, and the growth and development of dental structure in children are features of five programs designed to promote dental health.*

## Michigan Gathers Data On Child Dental Care

The most effective approach in a dental corrective program is to begin with the younger children, correct all existing dental defects, and then recall the patient periodically for maintenance work. With this working hypothesis and with a statewide program as an objective, the Michigan State Health Department established a dental clinic in Sturgis in 1945. Data on the time required to care for dental needs of Michigan children as well as information on the annual increment of caries were collected by the clinic.

Charles J. Donnelly, D.D.S., M.P.H., dental officer in the public dentistry section of the Michigan State Health Department, presented the findings of the pilot study. The data, he said, substantiate the conviction that the benefits are not limited to the group under treatment but extend to other children and even to adults in the community.

### *The Plan*

With the cooperation of local dentists and school authorities and

with the approval of the Michigan State Dental Association's Board of Trustees, the plan was carried out in Sturgis (7,000 population) because it had never had any kind of dental health program.

Donnelly reported that the initial care program was limited to preschool, kindergarten, and first and second grade children; that once the child's accumulated dental needs were cared for, complete maintenance care was given periodically; that the plan provided for the addition of a new group of children every year; and that maintenance care for a 12-month period required between one-third and one-half the time needed for the initial correction of accumulated defects.

To determine how many parents would accept dental care for their children, no concentrated educational program was undertaken at first to enlist them, Donnelly said. In the beginning, 73 percent of those eligible took advantage of the clinic facilities. Acceptance, he said, varied from year to year with the effort expended to explain the objectives and value of the program, and—as the reputation of the clinic gained—finally approached 100 percent.

High standards were set and a high quality of service was maintained, Donnelly said. For instance, bitewing radiographs were taken annually and other radiographs when necessary, in addition to treating carious teeth, removing infected teeth, pulp-capping, pulpotomy, castings, and analysis of saliva samples. Lactobacillus counts and caries history determined the number of recalls, which averaged two per year.

The individual services given by the dentist were timed by the assistant. It was found that a full year of maintenance care requires only about 1 hour of dentist chair time (up to the age of 12 years), he said.

Donnelly cited statistical results which, among others, showed: that the time required for initial care of accumulated defects ascended from 83 minutes for the average 5-year-old to 173 minutes for the average 9-year-old; that maintenance care varied from 56 minutes for the 7-year-old to 128 minutes for the 14-year-old.

A 5-year evaluation of the plan was made in 1951. Much of the data is yet to be analyzed, Donnelly reported. The Sturgis program employed one dentist and at the close had nearly 800 active cases under treatment.

## Clinical Dental Research Probes Into Many Areas

Patients are being studied at the National Institute of Dental Research to obtain more information on problems in such fields as oral pathology, periodontal disease, and the growth and development of dental structure in children, said Ralph S. Lloyd, D.D.S., chief of the Dental Department at the National Institutes of Health Clinical Center, and acting chief of the NIDR Clinical Investigations Branch.

In the first year of the Clinical Center's operation, Lloyd said, National Institute of Dental Research investigators began several laboratory, field, and clinical research studies of dental problems. Among the particular interests of NIDR research workers are those problems—such as chronic stomatitis, gingivitis, and leukoplakia—demanding combined medical and dental attention. The complete and detailed series of diagnostic and other tests carried out for each patient at the Clinical Center offer valuable material for such investigations, he continued.

For instance, a study of the systemic condition of persons with periodontal disease was recently undertaken. A method of gauging the severity of this disease, which involves tissues surrounding the tooth, proved valuable in field studies and was given a successful clinical trial. It was found, according to Lloyd, "that an accurate periodontal score could be assigned by a cursory glance." The patient's clinical record is then examined for conditions which may be correlated with the periodontal finding.

### *Fluoride Studies*

Three of the research studies which Lloyd reported deal with fluorides. An epidemiological survey of the physiological effects of fluorides in the drinking water of two population groups is being conducted. A related investigation is concerned with the possible histological or chemical changes in individuals who live in high-fluoride areas. Lloyd described the third investigation as a "carefully conducted balance study" in the measurement of fluoride turnover for patients with cardiovascular or renal diseases as compared to the turnover for normal persons in control units.

### *Other Fields*

In the field of growth and development, more simplified ways of treating specific types of malocclusion are being sought. Lloyd said that other projects in this field include continuation of research begun elsewhere, such as the study of the growth and development of the heads of young children who have cleft lips and cleft palates, and of children with other congenital and acquired anomalies.

Data are to be accumulated on general anesthesia used in oral surgery to aid in the evaluation of the new, intravenously administered drugs. Also, investigators plan to begin a study of cysts of the mandible and maxilla.

A comparison of conservative and radical surgical techniques in the treatment of periodontal disease has been started, so that, with other clinical investigations, NIDR research workers may develop diagnostic criteria which will help to forecast the result of treatment.

### *Future Plans*

Other studies suggested include studies of the effects of radiation on oral health and oral infection, of the effects of steroids, hormones and re-

lated substances on oral lesions, and of dental prosthetics. An investigation in the last named group would deal with tissue tolerance to the prosthetic appliances. A study intended to discover ways of determining a definite working and rest bite in prosthetics has also been suggested, according to Lloyd.

## Assign Learning Programs To Education Specialists

In conducting educational programs in dental health, the health department should seek assistance from specialists in educational methodology, suggested H. Shirley Dwyer, D.D.S., director, division of dental hygiene, Arkansas State Board of Health.

He described an experimental dental health teaching project which demonstrated that by stimulating the school teacher's interest and by providing the facts the teacher was able to transmit the health lessons to the school children in an understandable form and integrated with the regular school subjects.

The use of a health coordinator in each of Arkansas' schools resulted subsequently in the appointment by the State Dental Society of Arkansas of a dental coordinator for each school, he said. The coordinator supplies the teachers with dental information, checks expenditures for educational materials, and helps stimulate greater efforts in promoting dental health. He is the dental society's representative to the conferences called by the State departments of health and education. His position offers a practical means of promoting dental health education at the local level.

### *The Dental Columnist*

Dwyer said the press could be invaluable in promoting a dental health program. He pointed out that in preparing a daily column a person with newspaper training could translate the technical terminology of a profession into the "earthy" language of the people, and also could take a local slant on items. A chatty style, colorful use of familiar words, and short sentences are necessary, he said, in warning that much material intended to be educational results in being only promotional.

In discussing use of radio and television for dramatizing public health programs, Dwyer cautioned that care be taken to make one point of emphasis only per broadcast. "Do not throw the entire dental textbook at them in 15 minutes," he said.

"Get the community interested in doing," Dwyer advised. Organize a community health council and point the way so that it can discover its own community needs, and, he added, the desire to meet these needs is almost sure to follow.

## Maryland Dental Service Stresses Child Care

An evaluation of the Maryland dental service program after several years of operation showed that a too high proportion of expenditures was going for prosthesis and too little for children's dentistry, according to Richard C. Leonard, D.D.S., M.S. P.H., chief of the division of dental health, Maryland State Department of Health.

To reverse these proportions, he said, children's services were expanded to include school dental clinics for all children.

The revised prosthesis service policy authorizes dentures for eligible persons 45 years of age and younger. Persons over 45 years of age must obtain approval of need for the denture from the County Advisory Committee on Medical Care.[1] A decision based upon the financial status of the program in relation to the patient's financial and medical status is made.

Leonard reviewed the State's medical care program beginning with its reactivation period in 1939. Legislation, effective June 1, 1945, placed the program under the guidance of the new State Council of Medical Care. All services at that time were limited to the indigent, said Leonard. The dental service program was an integral part of the medical care plan.

Control and administration, so far as possible, were initially handled by county authorities and county professional groups. This made the extent of services vary from county to county, Leonard pointed out. Uniformity of program has now been achieved, he explained, and both the amount of service and the character of service have changed during the years. For example, fluoride therapy and prosthetic service are now offered, more emphasis is now placed on preventive dentistry, and the school dental clinic work has greatly expanded and now requires no economic limitation for children.

### *Dentists Cooperate*

In 1952, approximately 50 percent of the Maryland dentists practicing in county areas participated in the dental care program, Leonard said. On each county advisory committee a practicing dentist represents the profession, another of many evidences of the cooperation of the dental profession in helping to develop the program, he noted.

Leonard recognized as justifiable the criticism of the low fees paid to participating dentists. This shortcoming, however, is governed by a legislatively determined budget which limits ability to raise fees.

In behalf of the dental fee schedule, Leonard said the fees are the high average of those suggested by county dentists and that too high fees would have threatened to defeat the entire program. Prior to the inauguration of the program, he pointed out, dentists gave a great deal of free service to the indigent and the medically indigent. The present fee schedule is at least some reward, he felt.

The indigent population of Maryland has varied between 13,000 and

17,500 persons, better than 50 percent of whom may be classified as aged persons (over 6,000 are over 65 years of age). About 31 percent of Maryland's indigents are under 20 years old and only approximately 12 percent are between 20 and 46 years old, said Leonard.

# The Sanitary Engineer . . .

*The many and complex problems of environmental sanitation and the challenges they present to engineering research are discussed. The new research program being developed by the Lawrence Experiment Station of the Massachusetts State Department of Public Health is described.*

## Epidemiologist-Sanitarian Collaboration Urged

New environmental controls to protect health will be needed as industry develops new techniques, stated Justin M. Andrews, Sc.D., Assistant Surgeon General and associate chief for program, Bureau of State Services of the Public Health Service.

The health implications and dimensions of these techniques must be determined, however, before controls can be instituted, and current practice in the control of communicable diseases, as well as new procedures and indexes, must be carefully examined, Andrews said.

In this connection, Andrews stated that epidemiological evaluation of isolation and quarantine has led to discontinuance of these measures in the control of some diseases and confirmed their usefulness in others.

Epidemiological review of fly control in the prevention of poliomyelitis demonstrated that this disease was apparently spread by contact with infected individuals or with carriers rather than by flies, he said. Epidemiological investigation revealed that malaria was spread by only a few species of mosquito and that control of those species was more economical than control of all mosquitoes.

Andrews suggested that, in view of the disappearance of cholera and the decline in numbers of typhoid carriers, the coliform index might also be reevaluated epidemiologically.

Bacteriological cultures of rectal swabs from children aged 10 years or less have given immediate and objective results, which are not obtainable from mortality and morbidity data, Andrews stated

He suggested that this procedure, together with comparisons of the prevalence of carriers in homogeneous populations, might be used by teams of epidemiologists and sanitary engineers in studying the epidemiology and evaluating the control of enteric diseases.

### *Water and Air Pollution*

Other areas in which sanitary engineers and epidemiologists can work together are water and air pollution control, Andrews stated. He stressed chemical and radioactive air pollutants and said that health, physical effectiveness, safety, and comfort will all be affected with increases in population, urbanization, industrialization, and the use of atomic energy.

Little is known about the chronic, cumulative effects of exposure to small quantities of chemical and physical contaminants of air and water, Andrews concluded.

To obtain etiological and epidemiological information about the consequences to human health and effectiveness of exposure to these substances, the sanitary engineer, he believes, will need to work closely with the toxicologist, the pulmonary physiologist, the pathologist, the roentgenologist, the radiologists, occupational health specialists, and with other sanitary engineers.

## Relocated Lawrence Station Develops New Research

The Lawrence Experiment Station, established in 1886 as part of the Massachusetts State Department of Public Health, has produced a roster of distinguished scientists, teachers, and natural philosophers who have united engineering and biology in the new world of sanitary science.

The station has been a proving ground for students and teachers from New England university engineering departments, including the Massachusetts Institute of Technology, as well as others seeking practical solutions to sewage and industrial waste disposal.

Thus, Clarence I. Sterling, deputy health commissioner of Massachusetts and chief sanitary engineer of the State health department, reviewed the station's contributions to research in public health. Thousands of problems have been tackled by its staff over the years, he said.

The station today is developing a new research program in keeping with its move to a modern building and new site, also, like the old site, along the Merrimack River at Lawrence, Mass., Sterling said. The new site was carefully selected in order that sufficient domestic sewage could be obtained to carry on the research work.

The new buildings house the formerly scattered bacteriological, radiological, biological, water and sewage, and air pollution laboratories. A special research laboratory has been set up to familiarize laboratory personnel with new techniques. A new plumbing research laboratory will train apprentice plumbers and others in the relationship between good plumbing and public health. One branch laboratory is still located at the University of Massachusetts at Amherst in the western part of the State.

Sterling said that the station has appointed a board of research consultants to help solve many of the new problems in sanitary engineering. Board members include the following representatives of the profession:

Harry P. Burden, Tufts College; Rolf Eliassen and Clair N. Sawyer, Massachusetts Institute of Technology; Ralph L. France, University of Massachusetts; Harry G. Hanson, Public Health Service; Charles E. Renn, Johns Hopkins University; Gordon M. Fair, J. Carrell Morris, and Leslie Silverman, Harvard University.

## Many New Complexities Challenge Researchers

Pressures of population and technology are rapidly unfolding new challenges to the sanitary engineering profession, according to Assistant Surgeon General Mark D. Hollis, chief engineer of the Public Health Service.

Among environmental forces injecting complications in public health work are the increasing variety and potency of polluting wastes, including those that are radioactive, in all phases of man's environment—air, water, food, shelter, and even space, Hollis pointed out. Methods of detecting, identifying, measuring, and appraising the quality of pollutants, especially in the atmosphere and in water are as yet insufficient to satisfy needs, he maintained, if controls are to be applied effectively and economically.

Although indicators and classical yardsticks now in use suited the needs of other times, Hollis said, "over-extension in their use by default is no solution to the newer problems. There is increasing evidence, for example, of waterborne virus diseases, yet we have no practicable methods for detecting their presence in water, nor any firm knowledge of the capacity of ordinary treatment facilities to remove them."

From still another angle, Hollis pointed to the failure to capture, reclaim, and put to productive use many wastes that are now being dissipated.

"Even in our own land," he said, "the relative decrease in availability of agricultural resources, such as fixed nitrogen, phosphates, and soil conditioners, has been reflected in notable increases of dollar value placed on fertilizers. It is anticipated that this trend will continue. As the relative abundance of basic resources decreases, the energy and dollar costs of conservation are more readily borne by the community."

Hollis called attention to current processes which recover many valuable materials heretofore regarded as wastes. Drying of sludge, recovering vitamin $B_{12}$ from sewage, and composts from solid wastes, and conversion of sewage into algal food, he regarded as symptoms of a trend which may be accelerated as population pressures increase.

"The sanitary engineering objective of waste disposal may profitably be shifted to include waste conversion and re-use," Hollis stated. "In a very substantial way sanitation will be facilitated by showing man how he can supply some of his basic demands by re-using what he already has."

He expressed hope that sanitary engineering research may be stimulated by close collaboration of the Robert A. Taft Sanitary Engineering Center with universities and other research resources. In addition to offering its services to these institutions, the center will focus its attention on development of methods for applying basic knowledge to national and regional problems which individual State institutions and industries find are beyond their jurisdiction or resources.

The center is now exploring methods of bringing its application work into phase with basic research of other institutions.

## Lists Planning Objectives For Sanitary Engineers

The World Health Organization estimates that 20 percent of the deaths in the world today are due to faulty environment, stated George O. Pierce, M.S., chief, environmental sanitation branch, Pan American Sanitary Bureau, Washington, D. C.

In many Latin-American countries, enteric diseases are still a leading cause of death, Pierce said, and effective methods of control of some other diseases related to the environment are not yet developed, as in the case of bilharziasis.

A variety of disciplines are needed to solve the many and complex problems of environmental sanitation, Pierce stated. Teamwork will be necessary between sanitary engineers and specialists in the physical, chemical, biological, and social sciences if solutions are to be found now and for problems that will result in the future from advances in technology, he said.

Sanitary engineers must be public health statesmen, Pierce said. They must be able to work with representatives of other governments and with specialists in agriculture, education, industrial production, and communications, and they must endeavor to understand what other people do, how they work, and the legal and other restrictions which apply to their work. In many countries, water supply and waste disposal problems will not be solved until economical, technically sound,

and socially acceptable methods are found, he said.

*Planning and Administration*

Pierce stated that the most important basic problem in public health is leadership in program planning and administration. He said that the community must be educated to do its part in the planning, and that the support of the medical, nursing, and organized engineering professions must be enlisted.

Plans for community health programs should include the collection of information on population characteristics, vital statistics, health institutions and personnel, governmental structure, voluntary health agencies, social institutions and customs, economic status of the population, geography, and climate, Pierce said.

In conclusion, Pierce stated that sanitary programs produce economic gains and help to control or to eradicate disease; as a result of improvements in health, a larger number of persons are gainfully employed; the economy expands because of new markets and new sources of labor and materials; and crop yields increase.

Results of changes in environment, he said, can be measured by reduced stream pollution, increase in number of families with safe water supplies, the quantity of available water per person, and other environmental factors.

# Health Program Evaluation . . .

*Not all measures of the effectiveness of a health program require the assistance of experts in statistics and the social sciences, but whatever the yardstick used, it must be handled with precision, in terms of well-defined objectives—according to the papers presented.*

## List Steps for Designing Evaluation Programs

Evaluation of a public health program should denote a measurement of its effectiveness, stated B. G. Greenberg, Ph.D., professor of biostatistics, University of North Carolina School of Public Health, and Berwyn F. Mattison, M.D., M.P.H., commissioner of health, Erie County Health Department, Buffalo, N. Y. "This effectiveness," they said, "should be measured in terms of the fulfillment of the program's objective."

Preparation of a clear-cut statement of the objectives is the first step in evaluating a program, they said. The person best qualified to state these objectives is the one responsible for instituting the program.

They said that formulation of the criteria for measuring the successful achievement of the intermediate goal and the design of an experiment or research study to measure precisely the criteria of success previously developed are the ensuing steps.

The ultimate objectives of most health programs, namely, reduction of mortality and morbidity, are too remote to be worthwhile indexes for evaluating a program, the authors continued. Consequently, a multitude of intermediate goals are substituted.

For example, in the preparation of health literature, the literature could be considered by some as having been "evaluated" if it passed the test of a readability formula. But in terms of the ultimate objectives, such evaluation assumes that the literature will reach a large proportion of the population for whom it was intended, that it will have some effect in motivating the reader, and that eventually a reduction in mortality will ensue.

According to the authors, what is loosely termed "evaluation" in public health is similar to diagnostic research in clinical medicine. "Evaluation" they restricted to "followup of effect of treatment." In the public health sense, treatment of the community is the institution of certain social actions for specific purposes, such as more clinics.

*A Design for Evaluation*

In designing evaluation studies, certain fundamentals merit consideration, Greenberg and Mattison said. These they listed as:

1. The need for a clear definition of the target population to be exposed to the program under evaluation.
2. The selection from the target population of a smaller group labeled the "sampled population" for intensive followup of the therapy.
3. The identification of particular subgroups within the sampled population so that individual variations of the program's effectiveness may be pointed out.
4. The division of the sampled population according to some experimental design into two homogeneous groups, experimental and control, and their allocation according to some scheme of randomization.
5. The application of a placebo to the control or comparison group to establish the validity of the evaluation.

Measurements for the two groups are made in accordance with the criteria and at the time agreed on, the authors continued. Comparisons are drawn, and if differences are observed, they are ascribed to the differences in treatment. If the sampled population represents a group of persons smaller in num-

ber than the target population, then differences between the two study groups might have arisen because of sampling fluctuations.

Tests of statistical significance are usually available to rule out or measure this possibility, they said, but it is inappropriate to use these tests for errors of observation other than those caused by sampling variations since such errors are apt to be much greater in size than the sampling errors.

## Every Program Step Needs Evaluation

Even if the term "evaluation" is limited to an appraisal of final program results, the first step in the process must always be an appraisal of the yardsticks used, maintained George James, M.D., M.P.H., and Herman E. Hilleboe, M.D., M.P.H., of the New York State Department of Health.

Dr. James is assistant commissioner for program development and evaluation, and Dr. Hilleboe is commissioner of health.

Of what use, they asked, is a final evaluation if the standards employed are unreliable, invalid, or unnecessary? They consider evaluation more as a scientifically critical point of view which must be built within chronic disease programs during each phase of development than as a special procedure which should be performed periodically.

The validation of the yardsticks forms short-range objectives for the program of the Albany Cardiovascular Health Center. James and Hilleboe stated it is with these yardsticks that planners can build step by step toward the long-range goals. It is in terms of these yardsticks, and only in such terms, that a true evaluation of the long-range goals becomes possible, they declared.

In their opinion, it is unlikely that a scientifically precise evaluation of any existing program for the "control" of adult heart disease could be performed using the yardsticks and disease classifications now available.

To indicate the types of evaluations which should be performed in the development of a new and complex program, James and Hilleboe presented selected data from the first 1,494 examinations performed at the Albany Cardiovascular Health Center. The center was established in 1953 to provide periodic examination of the cardiovascular status of 2,000 male State employees, aged 40–54 years, in the Albany area.

### *Medical History*

Noting that physicians frequently place great reliance on the medical history of their patients in making a diagnosis, they offered the following data:

"Pain, heaviness, or discomfort in the chest" was the symptom with the greatest relative frequency among patients with coronary heart disease, in comparison with patients with hypertensive heart disease, hypertension, or hemorrhoids. "Aching or tenderness around the heart," "unusually fatigued during day," "feel choked or smothered," and "short wind" were symptoms also associated significantly with coronary heart disease, but "feel heart beating," "heart races," and "ankles swell" occurred about equally in all the diagnostic groups.

Would each competent physician elicit the same symptoms from the same patient? This is one of the questions, they stated, that must be answered before deciding to rely for screening purposes on the five symptoms which appeared most frequently among coronary heart disease patients.

They found that eight physicians seemed about equal in eliciting the third, fourth, and fifth symptoms given above, but not in eliciting the first and second.

They found, further, that two physicians were responsible for the bulk of the variance for the first symptom and one physician for the second symptom.

Also presented as illustrative of evaluation in terms of short-range objectives were data on the family history of the patients; on the electrocardiogram and the X-ray film as techniques for detecting cardiac enlargement; and on the association of age, obesity, and blood pressure.

### *Long-Range Objectives*

To develop and evaluate measures of the prevalence and incidence of various conditions among the study group, one of the long-range objectives of the program, requires a relatively low refusal rate among this group, James and Hilleboe pointed out. They reported an overall refusal rate among 1,677 State employees of 10.9 percent. The next

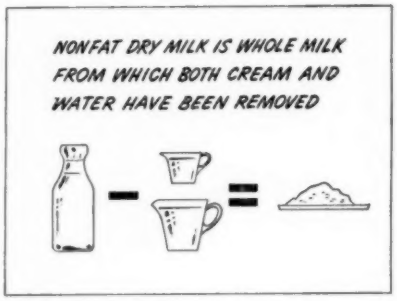
**Diagnoses made at the Albany Cardiovascular Health Center among 1,394 persons, aged 40–54 years**

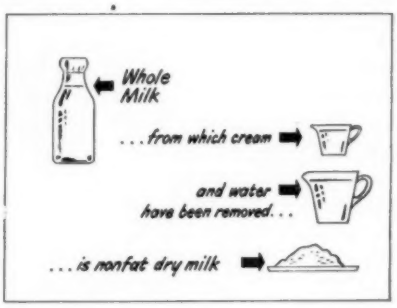
| Disease | Diagnosed at center | | Previously known | | Newly diagnosed | |
|---|---|---|---|---|---|---|
| | Number | Rate per 1,000 | Number | Rate per 1,000 | Number | Rate per 1,000 |
| Tuberculosis | 48 | 34 | 26 | 19 | 22 | 16 |
| Bronchial asthma | 11 | 8 | 5 | 4 | 6 | 4 |
| Diabetes | 15 | 11 | 12 | 9 | 3 | 2 |
| Chronic arthritis | 22 | 16 | 18 | 13 | 4 | 3 |
| Coronary heart disease | 42 | 30 | 30 | 21 | 12 | 9 |
| Hypertensive heart disease | 42 | 30 | 0 | 0 | 42 | 30 |
| Hypertension | 184 | 132 | 62 | 44 | 122 | 88 |


326578—55——4

step, an attempt to assess the extent of heart disease among the refusals, is now being developed, they said.

Concerning prevalence of the various heart diseases in the group, they provided the data in the accompanying table. The diagnostic categories are based upon currently detectable signs and symptoms, they said. In their opinion, these are almost certainly not the best possible yardsticks for this purpose.




## Sampling in the Evaluation Of Education Materials

Small, carefully selected population samples can be adequate and can be used to advantage in evaluating health education materials in the process of development, stated Irwin M. Rosenstock, Ph.D., assistant chief, Behavioral Studies, Public Health Service. However, they should be used with caution, particularly in evaluating the actual effectiveness of materials, he warned.

Rosenstock discussed two types of evaluation. One is pretesting while material is being developed to determine the best approach to the subject and to discover any misunderstandings, misinterpretations, or other barriers to successful communication. The second type is evaluation of effectiveness to determine how much a group may have been influenced in the desired direction.

### *Pretesting*

According to Rosenstock, the size of the sample to be used in pretesting depends upon the purpose of the test and the degree of intelligence, amount of education, and experiences of the group from which the sample is selected, the number of population variables relating to possible barriers to understanding, the degree of precision desired in measuring these barriers, and the homogeneity of the group to be reached.

As the heterogeneity of the intended audience increases, he said, the size of the sample necessary for pretesting also increases, and the more barriers to communication to be identified, the larger the sample needed. Small samples are more likely to be adequate when they are composed of a homogeneous group of persons for whom the educational material is designed.

Among several examples which he cited, Rosenstock reported that pretesting a chart illustrating the relationship between whole milk and nonfat dry milk revealed that women with less than 8 years of schooling did not understand the minus and equals signs. One woman said the chart showed that "after you pour off the cream you have water." Another said that the minus sign showed how far the cream should be taken off the bottle. When the chart was revised, using words and arrows instead of algebraic signs, it was much better understood.

Pretesting a pamphlet recommending the use of salt-soda solution in place of blood plasma showed that most readers misinterpreted the meaning of shock and failed to associate the use of salt-soda solution with the treatment of burns. Several persons said that they would have the injured person drink the solution so that he would not feel shocked when he looked at his injuries, and one woman said that she would drink the solution so that she would not be shocked when she looked at the injured person.

Rosenstock said that any changes made in the material as a result of the initial pretesting must be tested on new groups, but care should be taken that the meaning of the portions being retested is not altered by presenting them out of the original context.

### *Evaluating Effectiveness*

The use of sampling, in determining the extent to which educational materials achieve their purpose is a much more complex procedure than sampling in pretesting. Selection of the sample and the determination of criteria and measures of effectiveness present difficulties which, Rosenstock said, may require the assistance of experts in statistics and in the social sciences. Pretesting can be learned by public health workers and rarely requires the assistance of experts.

## Dental Health Programs Evaluated Objectively

The precise measures of dental caries available today provide the means for continuing objective appraisal of dental health programs, stated George A. Nevitt, D.D.S., M.S.P.H., in a review reemphasizing dental health program evaluation. Dr. Nevitt is regional dental consultant, Region IX office of the Public Health Service, San Francisco.

The appraisal, he specified, is dependent upon periodic age-specific comparisons of dental caries prevalence and tooth mortality. The basic measure is the DMF index, that is, the number of teeth decayed, missing or indicated for extraction, and filled.

Explaining how the DMF index is

used, he pointed out that a decrease in the DMF indicates success, for it shows that the prevalence and incidence of dental caries is being reduced. He noted also that changes in the components may indicate progress even though the total DMF does not change. A decrease in the number of permanent teeth lost would show a reduction in tooth mortality, he said. An increase in the F component would indicate that more needs are being met and therefore that future reductions in tooth mortality might be expected.

Already available or under study, Nevitt remarked, are measures applicable to phases of dental health programs other than dental caries control. He mentioned the graded classification system for measuring fluorosis, or mottled enamel, the PMA index for measuring severity of gingivitis, and the dentofacial index for measuring degrees of malocclusion.

Dental health programs can, in certain instances, be evaluated by subjective appraisal, Nevitt claimed. Whether or not subjective appraisal can be used legitimately, he indicated, is determined by the kind of planning done. For example, he said, when the effectiveness of a procedure such as topical fluoride application has been thoroughly field tested before it is introduced generally, the mere institution of the activity is a sign of progress.

Nevitt called subjective appraisal the most basic, simple evaluation technique available today. It requires no survey, no statistical measure, no clever devices, he said. It requires only a review of the previously prepared plan and the answer to the vital question, "Was this done?"

### *Acceptable Planning*

Because evaluation, of any type, is so dependent upon planning, Nevitt reviewed briefly the requirements of acceptable planning.

1. To accomplish a program objective, both long-range and intermediate goals must be planned.

2. A specific plan listing each intermediate objective should be prepared periodically.

3. Detailed procedural methods must be outlined for accomplishing each intermediate objective.

## Measure Gain in Learning In Workshop Tests

Student and faculty opinions regarding a student's contribution to a learning situation should receive greater emphasis, when it comes to grading, than the actual knowledge he gains, according to objective measurements. This finding was indicated in a health education workshop, according to John H. Shaw, Ed.D., professor of health and physical education, Syracuse University, and Andrew S. Coccari, M.A., director of physical education, The Hills School, Huntington, N. Y.

Most of the students enrolled in the workshop were elementary school teachers or nurses. The students were divided into four small groups, each with a full-time instructor. About half the class time was spent in working in these groups; otherwise, the workshop met as one unit.

Attempts were made to evaluate the program statistically:

1. By measurements of the actual increase, or decrease, of knowledge through the use of pretest and posttest forms (A and B) of the Shaw-Troyer Health Education Test, a standard health knowledge test.

2. By determinations of the relationship which exists between peer and instructor ratings of the contribution of individuals to the workshop.

3. By determinations of the relationship which exists between health knowledge and the contribution of an individual to the workshop as measured by student and instructor ratings.

Fifty-nine students took both tests, which were corrected and returned to each one for discussion.

### *Significant Correlation*

The participants were told that the first test was to determine their present knowledge about health. When the second test was administered, they were told that it would measure the groups' gain in knowledge. Students were encouraged to do their best and were assured that the scores would not be used as a basis for grading.

The results of the two tests were assembled and compared as to raw scores and percentile rank.

Total group gain in both scores and percentiles were figured. These results tended to show a fairly consistent increase in the number of correct answers on the second test as compared with the first.

This increase was clearly evident in the 11.1 percent gain in percentile ranking on the second test, as compared with the first test, and the differences between the two scores are statistically significant.

There was an average gain in health knowledge per individual of 5.7 in raw score, and a total gain of 338.

In attempting to determine the relationship which exists between a person's health knowledge and his contribution to the workshop, each instructor, at the end of the sessions, rated his group in accordance with the contribution he thought each member had made. He was also asked to have each student rate all participants in his group.

Although the instructors had a little forewarning that they were to rate students, the students had none. Nor did they have a chance to collaborate in making their judgments. Replies were anonymous.

The mean for each individual in the group was computed, and members were then ranked in terms of their mean score. The product moment correlation of instructor ratings and mean peer ratings was then figured to determine the relationship between peer and instructor ratings of the individual's contribution. This correlation was highly significant, +.82, Shaw and Coccari stated,

and it is on the basis of this finding that they recommend giving greater weight to student and faculty judgments as to an individual's classroom contribution.

By correlating the mean peer ratings and the results of the "before" and "after" tests, the authors found that there is apparently very little relationship between a student's gain in knowledge of health education, as measured by the objective tests, and the rating of his contribution to a learning situation, as measured by staff and fellow members. The correlation of mean peer ratings and scores was +.38 on the pretest and +.01 on the post-test.

## Urges Wider Application Of Program Evaluation

More and better applications of the evaluation yardstick to program progress and achievement were advocated by Andie L. Knutson, Ph.D., chief of Behavioral Studies, Public Health Service, and Benjamin Shimberg, Ph.D., Educational Testing Service, Princeton, N. J.

They described program progress evaluation as the step-by-step assessment of each new phase of a program to keep it headed toward the intended goal. This type of evaluation, they said, yields usable results when they are needed and helps increase the likelihood that the program will be effective.

Program achievement evaluation determines whether or not the goal has been reached, they explained.

The worth of decisions in either type of evaluation, Knutson and Shimberg pointed out, will depend on asking the right questions and recognizing the significance of relevant variables. This means, they said, differentiating fact from opinion, reliable data from guesswork, and assumptions and hypotheses from firmly established knowledge and principles.

Either type of evaluation can be applied independently of the other, or both may be applied concurrently, even within the same study, they said.

### *TV vs. Classroom*

They gave as an illustration of dual application an evaluation of the effectiveness of television as a medium for teaching home nursing.

In a study sponsored by the National American Red Cross, one group of women received all their instruction through a series of 13 television programs in Houston, Tex. A second group took the same television course plus an additional hour a week in organized practice sessions; and a third group was instructed by the conventional classroom method, they reported.

A written test and a performance test revealed that all three groups learned about the same amount, regardless of the instruction method, although specific differences occurred. Thus, the evaluation of achievement showed that the teaching of home nursing by television was, in general, as effective as teaching in the classroom, they said.

Further analysis of the test data and inclusion of a questionnaire helped identify difficulties in course content, method, and focus for use in planning future programs and indicated the need of evaluation while a program is in progress, Knutson and Shimberg reported.

For example, they said, performance test data revealed that more than 40 percent of the women who had taken the classroom course, as well as those in the television-plus-practice group, could not read a clinical thermometer accurately. The TV-only group showed no improvement at all.

This finding, they said, clearly indicated need for further study and correction of this difficulty in planing future courses.

Their data suggested the need for making the practice sessions more effective, if they were to be retained; a change in TV program hours; coverage of the course within a month instead of 7 weeks; and inclusion of a course outline or study guide.

## Shows Way To Evaluate State Nutrition Program

A method of evaluating nutrition programs based on the intermediate goal of a wide use of nutritional knowledge was presented by John H. Browe, M.D., M.P.H., bureau of nutrition director in the New York State Department of Health.

Nutrition programs are very difficult to evaluate, according to Browe. Even evaluation such as he advocated is difficult for the New York nutrition bureau, he said, because the nutritionists there have only an indirect relationship with the people they hope to help. A large part of the bureau's work consists of consultations with other professional personnel who provide the actual services.

The bureau's immediate problem was to determine the effectiveness of its existing nutrition programs, Browe said. To find just what the bureau was doing, a review was made of the monthly reports by individual nutritionists and the monthly bureau reports for 1952, the last calendar year completed before the survey. A side result was that the study showed up the weaknesses of the reports and these inadequacies have now been changed.

### *Classification Shift*

The activities in these reports were arranged systematically according to the agencies, organizations, and persons with whom the bureau members worked. It was decided to change this classification by considering the activities in relation to the particular nutritional needs of the different groups of people actually served. For instance, the activity which in the past was recorded as participation in an institute for nursing home operators is now listed in the chronically ill category.

Considering the activity in this manner places it in proper perspective and stimulates thought about goals and objectives, Browe said.

A number of similar categories

have been set up. The first major division was between the well and the sick. The categories for well persons were based on age or physiological state—pregnancy, infancy, early childhood, late childhood, adolescence, adulthood, and old age. The sick are divided into the acutely ill, the chronically ill, the malnourished, and those with particular disabilities such as diabetes, obesity, or heart disease.

Browe expects to have, at the end of 1954, a complete record with sufficient incidental data to know all the bureau's activities for population groups. He hopes to relate this information to the entire need for such activities and, on the basis of this information, to determine the bureau's future program development. This analysis of available data should, in his opinion, provide a solid framework for evaluation on more objective lines.

*Program Tested*

Browe offered one example of the application of this evaluation technique to an existing program for pregnant women:

The bureau's contact was with public health nurses who taught mothers' classes. Evaluation began by testing the nurses' knowledge of nutrition. Staff education for the nurses was planned by nutritionists on the basis of information gained from the tests. These nutritionists then observed classes taught by the nurses and asked supervising nurses for their opinions of the project. The nutritionists also asked the mothers attending the classes about their knowledge of nutrition. The nurses were asked to observe if any changes in nutritional practices took place in the homes.

Not all types of service offered by the bureau can be evaluated this easily, said Browe.

However, a clear understanding of the purpose of a program is necessary before any evaluation is possible, he continued. There must be a willingness to find out if the purpose has been accomplished. The selection of an objective criterion is usually possible, he said, and it is upon this modest beginning that the evaluation of any nutrition program must depend.

## New Classification Scheme For CV–R Deaths Outlined

An attempt to classify deaths from cardiovascular-renal disease in rubrics said to give both an etiological and an anatomical description of the cause of death was reported by Louis Weiner, Marjorie T. Bellows, Grace H. MacAvoy, and Eli V. Cohen.

Miss Bellows is chief statistician, American Heart Association. Mr. Weiner, Miss MacAvoy, and Mr. Cohen are with the bureau of records and statistics, New York City Health Department; they are, respectively, chief, statistical division; nosologist; and administrative assistant, tabulating division.

The data used in the study were obtained from multiple-cause cards prepared by the New York City Department of Health early in 1954. They relate to 2,587 certificates on which the underlying cause of death, selected by the conventional rules, was some cardiovascular-renal disease. The authors asserted that etiology and anatomical involvement could be determined for more than 99 percent of the certificates on which at least two cardiovascular-renal conditions were mentioned, and for 86.5 percent of the certificates on which only a single cause was mentioned.

The major changes resulting from the new classification, according to the authors, were (1) an increase in the number of deaths showing hypertensive etiology, and (2) determination of the etiology in more than three-quarters of the deaths ascribed by the International Statistical Classification to cerebral vascular lesions. The proportion of deaths unclassifiable as to etiology was particularly high in the cause-of-death groups involving nephritis.

# The Handicapped Child . . .

*Itinerant teachers bring the classroom to the home of the blind child; vision screening tests are found to place many in sight-saving classes who do not need it; some institutionalized orthopedic patients go home as a result of a review committee's recheck on status, and some guidelines are offered to help communities help mentally retarded children.*

## Care of Handicapped Reviewed by New York

Evidence that certain types of handicapped children in the New York City program have been over-institutionalized was presented by five members of the bureau for handicapped children of the New York City Department of Health.

Bureau surveys discovered that the orthopedically handicapped children cared for in hospitals and convalescent homes through the bureau's medical rehabilitation payment program were not receiving the optimum care needed for their treatment and rehabilitation and that they needed more careful and frequent evaluation.

Reporting the study were Helen M. Wallace, M.D., director, Robert S. Siffert, M.D., senior orthopedic consultant, Horace Yu, M.D., orthopedic consultant, Margaret A. Losty, R.N., coordinator of the hospital consultation program, and Helen M. Gossett, acting chief of medical social work, all of the bureau for handicapped children.

### *Review Committee*

Described in detail was one of the remedial steps taken to modify or change the services as the condition and needs of the patients changed. A review committee was formed to recheck primarily the status of all long-term handicapped children provided institutional care by the program.

During the first 6 months, June–December 1953, of the committee's work, records of 210 patients in 20 institutions were reviewed. Of the 10 institutions caring for 180 of the patients, 5 were classified as convalescent institutions and cared for 121 patients.

Inpatient care averaged 575 days per child and the program cost averaged $4,205 per child. A total of $883,091 had been authorized.

The review committee recommended the following changes for 100 of the 210 children: 48, return home; 37, screening for admission to special public school classes for cerebral palsied children; 8, transferral from hospitals to a convalescent institution; 2, foster home placement; 2, admission to the State institution for the mentally retarded; 2, transferral from convalescent homes to a hospital; and 1, admission to a residential school for the blind.

The demonstrated value of this approach has led to the review of the records each 6 months, the bureau members said.

### *Consultation Program*

In conjunction with the review activities, they reported, the bureau has developed a hospital consultation program designed to assist the participating institutions in improving patient care. In addition to better care, they pointed out, the information about the patient and a working knowledge of the institution gained through the consultation program has helped the review committee operate.

The review committee's activities, they believe, may reshape community services for handicapped children. The end result may be fewer inpatient beds in hospitals and convalescent homes, strengthened outpatient services, and more public school classes for children with cerebral palsy and other orthopedic handicaps, they said.

Also likely, they stated, is a reevaluation of convalescent care—the type of inpatient services the convalescent home should provide and whether alternate services, such as a foster home program and better housing, should be developed.

## Would Overhaul Criteria For Sightsaving Classes

Criteria used for the selection of children to be placed in sightsaving classes were disputed on medical grounds and on the basis of experience with 500 or more visually handicapped youngsters by Ralph C. Lanciano, M.D., LL.D., chief ophthalmologist for the Philadelphia Board of Public Education, and an instructor in pediatric ophthalmology at the University of Pennsylvania Graduate School of Medicine.

Lanciano saw no reason for assigning a child with usefully corrected vision to a sightsaving class if he can recognize blackboard writing from a reasonable distance and can read textbook 12-point type without difficulty. He based his opinion on a study of all children examined for admission to sightsaving classes in Philadelphia for the last 9 years.

Many State and city regulations governing the placement of visually handicapped children, he said, are outmoded. The criteria established by these regulations are impractical and unrealistic by modern ophthalmological standards, he continued.

### *Modern Concept*

Lanciano objected to the method of relying on a child's recognition of test types on the Snellen chart to determine his power of vision. The child's response, according to Lanciano, depends on a number of factors in addition to his visual acuity. His power of attention, his willingness to cooperate, and his reading ability must be taken into account. It is also necessary, Lanciano said, to consider the competence of the child's nervous system to transmit images from the eye to the visual area in the brain.

The regulations of two States, New York and Ohio, recommend special classes for children who, after correction, are unable to read 5-point type, said Lanciano. But elementary and high school textbooks are rarely, if ever, printed in a type less than 12-point, according to Lanciano. He considers children visually handicapped if adequate correction doesn't enable them to read 10-point type.

Lanciano also disagrees with those regulations which call for special treatment of children if they have 20/70 corrected vision in the better eye. A child with this defect, he said, doesn't recognize images less than 1½ inches high from a distance of 20 feet. Legible blackboard writing, he continued, doesn't include letters smaller than 1½ inches in height, and modern classrooms can solve the problem by seating adjustments.

The idea behind many of these regulations, said Lanciano, is that sightsaving classes can retard, arrest, or ameliorate the pathological processes. He claimed, however, the greater majority of the clinical entities noted in children attending these classes are determined by heredity or by degenerative, con-

genital, or maldevelopmental processes, none of which are subject to environmental control.

The decision to place a child in sightsaving classes should not be based on the degree of visual loss or on a clinical label, said the speaker. Instead one should determine how much visual function remains and what the child can do with it in terms of the curricular demands of regular education.

## Community Planning Urged For Mentally Retarded

Comprehensive planning by the community to deal with the problem of mental retardation, with leadership provided by public health workers, was urged by Joseph Wortis, M.D., director of pediatric psychiatry, Jewish Hospital of Brooklyn.

Public health workers can be especially useful by sharing with parent groups the modern scientific knowledge needed to cope with the problem, he said, pointing out that parent groups tend to become focal points of activity in this field.

Although institutions for the care of severely retarded persons will continue to be needed, the future development of work in this field demands increased attention to the encouragement of community facilities, Wortis said. Institutions, he added, should aim to return as many children as possible, as soon as possible, back to the community.

He reported that an estimated 60 to 80 percent of the patients of the Jewish Hospital's retardation clinic could, under favorable circumstances, perform socially useful work in a supervised setting. During recent years, he stated, institutionalization has been recommended for only 24 percent of the children seen at the clinic. The figure would have been lower if suitable family or community arrangements had been available, he maintained.

### *Recommended Approach*

Stressing the need for close integration of educational, recreational, medical, and vocational services for the mentally retarded, Wortis made the following general suggestions:

1. Appropriate schooling should be provided for all retarded children, except the very few incapable of learning.

2. Many mildly retarded children, especially the large number who can be described as educationally underprivileged, will do much better in classes with normal children than segregated, if the classes are small enough to allow teachers to give them the consideration they need.

3. Classes for the more retarded should be even smaller.

4. Special schooling need not be limited to ordinary academic training.

5. All-day schools should be made available to children needing care and supervision which their families cannot provide.

6. Diagnostic and rehabilitation clinics must be more widely established, preferably in a hospital setting where teams of workers may study the children and assist in their rehabilitation.

7. Distressed and overburdened families need the enlightened help of social agencies.

8. Vocational training and vocational placement under suitable safeguards must be provided for the older children.

### *Scope of the Problem*

Wortis estimated that 3 percent of the children in this country, about 700,000 of the children attending school today, are likely to require special educational help because of mental retardation. However, only about 115,000 children are attending special educational facilities, he said, stressing the difficulty of making any statistical estimate of the scope of the problem because of the lack of reliable data and the wide variation in definitions of terms.

The uncritical use of mental tests has served to perpetuate some misconceptions concerning the nature of mental retardation, particularly mild retardation, Wortis declared. Since all mental tests are tests of performance and performance is the result of both innate capacity and previous training, he said, it can be seen why socially deprived persons, who tend to score low on the tests, have often been falsely regarded as biologically defective.

On the other hand, Wortis continued, there are many persons whose biological deficiencies are not given the special consideration they demand. He mentioned mongoloids as one group and indicated that many mongoloids could benefit from family life and from special training in their own communities.

## Lists Education Trends For Blind Youngsters

How are present educational trends enriching the lives of blind children? What of the future of these children?

Three basic, but greatly varying, patterns are followed in the education of blind children, Georgie Lee Abel, M.A., consultant in education, American Foundation for the Blind, New York City, said, in discussing the gains being made toward the effective functioning of the future blind adult.

The newest is the itinerant plan, which makes it possible for an occasional blind child to remain in his own school district and have necessary services brought to him by qualified teachers or consultants, Abel explained. This system is found where there are not enough pupils to justify the expense of a teacher and a specialized program. Where it is constructively set up, it works well for older children, she continued.

Education in a residential school for the blind and specialized programs or braille classes in the public schools are the other typical pat-

terns, Abel said. The former is recognizing the significance of more constructive home and school relations for the isolated child. The latter is turning into the "resource room" where the blind child is enrolled in the regular class and returns to the specialist teacher for help when necessary. The resource teacher is available to other teachers who have blind children in their classes. She prepares comparable text and reference materials in braille for the blind children, actually teaches them certain skills, and counsels their needs.

*Gains of the Present*

In listing some of the professional gains, Abel said that the future should seek to free blind individuals from many of the past prejudices of their sighted friends who still find it difficult to react with respect and understanding. Her list included these main points:

1. The establishment of more preschool programs for blind children represents perhaps the greatest single step in more effective educational planning in their behalf.
2. The greatest contribution of the present can be found in the parents, who, when given sufficient help as soon as needed, are showing that they are capable of accepting and understanding their children.
3. Important sociological and psychological research has been most productive, as to parent-child relations, adjustment to blindness, emotional needs of blind children, and so forth.
4. Teacher preparation facilities are improving; teachers are showing a capacity to accept the responsibility for planning constructive courses.
5. More cooperative planning is being accomplished at the State level in the interest of screening, case finding, and evaluation of the most effective placement.
6. General health and welfare agencies are expressing an increased desire to serve blind children and their families.
7. Through the process of study, action, and practice, carefully developed legislation is being achieved which will affect and aid blind as well as other handicapped children.

## Offers Checklist as Aid To Program Planning

A checklist to help a community organization evaluate its position in the community and to determine its offering toward a proposed program was presented by **Louis Spekter, M.D., M.P.H.**, director of the bureau of maternal and child hygiene, Connecticut State Department of Health, during his discussion of ways to get maximum use of available community resources in giving aid to children with orthopedic conditions.

Some of the items to be evaluated for a program include purpose and objectives, types of services needed, standards for the conditions to be served, geographic area, estimated number of persons to be served, source of funds and budget, personnel needed, personnel available, and additional personnel to be recruited.

With a clear picture of the facilities available and of the program to be superimposed, the community may develop the program for the handicapped children upon a set of major principles which Spekter itemized:

1. Base planning upon the knowledge of the extent and nature of the problem.
2. Define the program and its limitations.
3. Set up a list of priorities.
4. Integrate the special services with overall health services.
5. Focus the program on the individuals for whom it is provided.
6. Give the local community a chance to assume as much responsibility for providing services as is possible.
7. Secure professional leadership to assure a high quality of services.
8. Provide for demonstrations and evaluations.
9. Encourage and make an opportunity for individuals and groups to participate.
10. Briefly and clearly put the plan in writing.

# Amebiasis, Infantile Diarrhea . . .

*Two amebacides are found effective in an Indiana outbreak; resuscitating equipment in a hospital is linked to the spread of diarrhea among the newborn; a fluorescein derivative opens the way to a possible new method of diagnosing amebic dysentery; and two reports are made on the potentially pathogenic characteristics of Escherichia coli O111.*

## Amebic Dysentery Work Gets a Green Light

The diagnosis of amebic dysentery by means of fluorescent antibodies is promising although the method remains to be perfected, according to a report made by Morris Goldman, Sc.D., director of the Intestinal Parasitology Laboratory at the Communicable Disease Center, Public Health Service.

Amebic dysentery is difficult to diagnose in any temperature climate, he continued, since the classic picture is rarely present, either clinically or parasitologically. In many cases, it is difficult to distinguish the

causative organism of the disease, *Endamoeba histolytica*, from a harmless organism commonly found in the intestinal tract of man, *Endamoeba coli*. The parasitology laboratory is particularly interested in developing objective criteria for differentiating the two organisms.

### *Recent Development*

The staining of antigen with antibodies tagged with fluorescein is a development based on the work of Coones and Kaplan in 1950. Antiserum for the antigen under investigation is obtained in the usual manner and is tagged with a fluorescein derivative. An antigen-antibody reaction is then produced. The product of this reaction can be seen in minute quantities because it emits a green fluorescence when exposed to ultraviolet light.

The fluorescence can be detected easily against the dark background with an ordinary microscope fitted with appropriate filters and illuminated with intense ultraviolet light, Goldman said.

Application of this method to the identification of cultures of *E. histolytica* and *E. coli* was described in recent papers by Goldman. In these he indicated that when cultured individuals of the two intestinal *Endamoeba* were mixed in a single tube, the fluorescent antibody method made it possible to distinguish the organism which causes amebic dysentery from the harmless parasite.

### *Latest Studies*

In the present paper, Goldman presented preliminary results obtained in the last few months. All previous work had been done with two species of amebae—the harmless and the harmful—grown in separate culture media and maintained in this way for a long time—in some cases for many years.

The present research was aimed at determining if the same results could be obtained with newly started cultures of amebae taken directly from the intestinal tract where, perhaps, the two species had been living together.

Accordingly, a collection of fresh stool samples was made. Those showing *Endamoeba* trophozoites or cysts were inoculated into culture media. Of 30 cultures inoculated, 11 were considered suitable for staining with fluorescent antibody to *E. histolytica* and *E. coli* within 3 days. An additional culture was stained one week after inoculation.

Emphasizing the practical importance of this experiment, Goldman found that it was possible to work with newly started cultures. In fact, he continued, the 48- and 72-hour cultures of the original inoculum frequently showed more amebae than later transfers. This did not mean, he added, that distinctions between the two types of freshly isolated amebae were always clearcut or easy to make. Though the results are encouraging, Goldman pointed out that there are indications of strain differences and that amebae of one species did not fluoresce to the same degree in different cultures. He said the test tube methods are too cumbersome and that work is progressing on staining smears.

The fluorescent antibody method of diagnosing intestinal amebae is not expected to replace other diagnostic procedures, he said. But he hopes that the method will become another valuable tool in the hands of parasitologists and technicians.

## Believe Infantile Diarrhea Has One Etiological Agent

Recent evidence indicating that *Escherichia coli* O111 is the sole pathogenic agent of acute infantile diarrhea was said to be reinforced by the study of an outbreak of the disease at the U. S. Army Hospital in Fort Belvoir, Va.

The study was reported by Lt. Col. Robert B. Lindberg, MSC, USA, Viola M. Young, Ph.D., bacteriologist, and Joel Warren, Ph.D., chief, all of the department of bacteriology, Army Medical Service Graduate School, Walter Reed Army Medical Center, and by Capt. W. D. Belnap, MC, USA, chief, pediatrics section, Fort Belvoir Station Hospital.

A total of 51 cases were hospitalized at Ft. Belvoir during the epidemic which reached its peak in December 1953 and virtually disappeared in February 1954, according to Lindberg and his associates. Patients under 1 year of age comprised 94.1 percent of the cases.

The epidemic, they said, was typical in its failure to affect breast-fed infants or to cause serious illness among older children. The overall mortality rate for the hospitalized cases was 15.7 percent, but for babies 28 days old or younger, it was 40 percent.

### *Unknown Virus*

The causal relationship of *E. coli* O111 to epidemic diarrhea of the newborn has been established in previous research, Lindberg and his coworkers continued, but the existence of an unknown virus as a concomitant etiological agent has often been suggested, and previous studies haven't eliminated that possibility.

In the present study stool and vomitus specimens of infants in an acute phase of the disease were subjected to laboratory examinations. *E. coli* O111 was recovered, often in virtually pure culture, from 90 percent of the cases cultured. The organism was also recovered, though infrequently, from adult carriers and contacts. Emphasis was placed on newer test techniques including tissue cultures, they said, but no viral agents were recovered.

Although they pointed out that negative results can never, in a sense, be absolute, Lindberg and his colleagues felt that their series of negative isolation attempts strengthen the idea that *E. coli* O111 may act as the sole etiological agent of infantile diarrhea.

The bacteriological aspects of the study resembled descriptions of other

epidemics—patients did not respond well to antibiotics. Considering recently reported success with neomycin, the drug of choice here, they said, may be only approximately indicated by in vitro tests.

The report went on to make the following points:

A low titer but significant agglutinin rise to *E. coli* O111 was shown in convalescent serums of 85 percent of patients examined, in contrast to earlier observations of absence of serologic response in this condition.

Cultural reactions of 87 strains showed small but significant numbers of strains varying from the basic pattern of delayed sucrose, salicin, and sorbitol fermentation. Eighty-three percent of the strains were hemolytic.

Indication of heightened toxicity for mice was obtained.

Schwartzman reactions, both systemic and cutaneous, were carried out, and a heightened tissue sensitizing and reacting potential was demonstrated for the O111 strains over those of control strains of *E. coli*. The possibility is present that absorption of sensitizing antigen with subsequent contact with the coliform strains may suffice to set up the fatal hemorrhagic reaction in infants.

## Colorado Study Indicts 4 Escherichia Colitypes

The isolation of 4 colitypes—*Escherichia coli* O111, O55, O73, and O86—from infant diarrhea cases in Denver supports the theory that *E. coli* is causing infantile diarrhea, according to Maj. C. D. Graber, M.S., bacteriologist at Fitzsimons Army Hospital, Denver.

In all, 128 diarrhea cases were found among 538 pediatric and nursery cases studied in Denver hospitals during 1952 and 1953. Of significance, Graber said, was the fact that no suspect *coli* pathogens were recovered from the normal stools of the remaining 410 children.

Graber told how the yearly outbreaks of enteric disease in Colorado led to a search for the suspect organism. A 15-month study was undertaken in Denver to determine the occurrence of possible pathogenic *coli* in all pediatric admissions, regardless of diarrhea.

### *The Study*

The study started with 33 cultures from diarrheas at Colorado General Hospital. These had been saved for typing, Graber explained. Most of the other cultures represented unselected sampling, he said.

At Fitzsimons and Colorado General, cultures were procured at intervals from all patients without regard to illness, he continued. At Children's Hospital and the Florence Crittenton Home, specimens were taken on all frank cases of diarrhea. Cultures were obtained by rectal swabs and examined for nonlactose fermenting enteric pathogens and suspect colitypes.

Although the rectal swab technique is excellent for *Shigella* work, Graber feels that the method fails to reach the most favorable fecal areas and that this may account for the low incidence of pathogenic colitypes he encountered.

*Salmonella paratyphi*, *Shigella flexneri* 3, and *Shigella sonnei* 1, Graber said, were the only established enteric pathogens isolated from the diarrhea cases, which were of more than mild character. The 4 colitypes were cultured from 4 diarrhea specimens, he continued. All were from male cases, and all except the O73 came from children under 1 year.

## Incriminates Resuscitators In Salmonellosis Spread

Diarrhea epidemics among newborn infants can in some instances result from infections spread by the resuscitators used to administer oxygen and carbon dioxide and to apply artificial suction to the babies, said A. Daniel Rubenstein, M.D., M.P.H., director of the division of hospitals, Massachusetts Department of Public Health, and associate clinical professor of epidemiology, Harvard School of Public Health.

Rubenstein also stated that, contrary to generally accepted opinion, some types of infectious diarrhea contacted in hospitals can be transmitted from infants to older children and adults at home. However, the resulting illness, which may be serious for the newborn, is only rarely noticeable, and then in a mild subclinical form, among household contacts. This indicates a marked susceptibility of newborn infants to organisms that are relatively harmless to older children and adults—a fact which must constantly be remembered, Rubenstein warned.

He reported the findings in two outbreaks of infectious diarrhea caused by *Salmonella* organisms. The resuscitator was considered a source of infection after an epidemic of salmonellosis persisted in one hospital despite a quarantine of sick infants and the sterilization of every other piece of obstetrical and nursery equipment. Tests by the diagnostic laboratory of the Massachusetts Department of Public Health isolated *Salmonella montevideo* from the water trap of the resuscitator. The same species had previously been recovered from infants affected by the disease, Rubenstein said.

### *Polluted Air*

An examination of the resuscitator showed that no provision had been made to prevent a contaminant in the water trap from escaping into the atmosphere with air exhausted from the apparatus. This made it apparent, Rubenstein continued, that contamination of the fluid in the trap had resulted in a spray of *Salmonella* organisms into the atmosphere of the delivery room when the resuscitator was being used for suction.

An outbreak of salmonellosis at the second hospital also appeared to result from a contaminated resus-

citator. Another species, *Salmonella bareilly*, was recovered in pure culture from the machine's water trap and also from sick infants.

Two factors associated with the epidemics made it probable, said Rubenstein, that the resuscitators were responsible. In both hospitals, the incidence of illness among exposed infants was high—52 percent in the first and 82 percent in the second. This suggested widespread distribution of the infectious agent. In both outbreaks, the interval between birth and the onset of illness was short enough to indicate that infection might have occurred at delivery or a short time later.

### *Steps Taken*

A series of cultures taken by the State health department in the course of regular hospital inspections showed that contamination of resuscitator water trap fluid was not infrequent. Quantitative analyses of organisms isolated by cultures often resulted in very high bacterial counts. according to Rubenstein. Since delivery room supervisors were completely unaware of danger from this source, the water traps were sometimes washed after use but seldom sterilized. Rubenstein said that the problem has been brought to the attention of manufacturers of resuscitating equipment.

Bacteriological study of resuscitators also revealed frequent contamination of catheters and face masks. Rubenstein suggested that this finding indicated a need for greater care on the part of delivery room supervisors and hospital administrators.

## Amebacides Pass Test In Indiana Outbreak

Two amebacides, oxytetracycline and fumagillin, were found equally effective when tested under ideal conditions during a 1953 epidemic of amebiasis in South Bend, Ind.

Reporting this result were Robert W. Sappenfield, M.D., instructor in the departments of preventive medicine, public health, and pediatrics, Louisiana State University School of Medicine, William M. Frye, Ph.D., M.D., professor of tropical medicine and dean of the same institution, F. R. N. Carter, M.D., South Bend city health officer, Carl Culbertson, M.D., acting director of the South Bend Medical Foundation, and two members of the Public Health Service Communicable Disease Center staff, Marion M. Brooke, Sc.D., chief of Parasitology and Mycology Section, and F. M. Payne, M.D., epidemic intelligence service officer, Enteric Disease Laboratory.

The outbreak of amebiasis, probably caused by the contamination of a private well, affected more than 800 employees of a woodworking plant, they reported. To avoid further spread of infection, the plant's source of water was changed to the municipal system before the scientists began their study.

The large number of people involved and the removal of the primary source of infection made the situation ideal for testing purposes. Previous evaluations, they said, were retarded by the necessity of treating a small number of people at one time or, if the groups were large, by the continued possibility of heavy, prolonged exposure to infections in such places as mental institutions and prisoner of war camps.

Sappenfield and his associates said that another ideal test condition was the apparent widespread infection with the same strains of *Endamoeba histolytica*. The organism had caused death and severe illness as well as asymptomatic infections among persons affected by the epidemic.

### *Drugs Used*

Oxytetracycline, they reported, was shown by Frye and his coworkers in Korea to be the most effective single agent then in use for the treatment of amebic dysentery. It was chosen for the present study to confirm its effectiveness on a great number of asymptomatic cases and also because conditions in South Bend permitted a longer followup period than was feasible in Korea.

Fumagillin was previously tested in the laboratory and on small groups of patients, they said. The present research project was its first comparison on a large scale with an agent known to be useful against amebic dysentery.

Of the 1,561 plant employees involved, 1,542 contributed specimens for examination and 52.4 percent were found to be harboring *E. histolytica*.

A checkup made 3 to 4 months after the drugs had been evenly distributed among the test group showed that *E. histolytica* had disappeared from the gastrointestinal tracts of 94.4 percent of those who had received oxytetracycline. Fumagillin, they reported, gave similar results in 93.8 percent of the patients treated. No evaluation of therapy for extra-intestinal amebiasis could be made. The number of patients who complained of reactions to therapy was approximately the same with both drugs, the research group reported. For the most part, they said, these complaints were mild and disappeared when treatment was completed.

## Trace Amebiasis Outbreaks To Factory's Wells

Chlorination of drinking water won't prevent disease outbreaks if badly constructed or located wells are contaminated by nearby sewers, according to three members of the Indiana State Board of Health who reported tracing a 1953 amebiasis outbreak to a chlorinated well water supply in a South Bend factory.

The project was discussed by Andrew C. Offutt, M.D., State health commissioner, B. A. Poole, B.S.C.E., director, bureau of environmental sanitation, and George G. Fassnacht, M.C.E., chief, water supply section.

Amebiasis, they explained, is used as a general term for all *Endamoeba histolytica* infections including amebic dysentery and related but less serious conditions. Waterborne amebiasis epidemics are rare in this country, they said, and acceptable chlorination procedures are sufficient protection against fairly common bacillary dysentery and coliform organisms but have no effect on *E. histolytica* cysts.

When Offutt and his associates found that 31 of 46 amebiasis cases in the South Bend area occurred among 1,500 employees of one factory, they concentrated their study on the plant. A sample survey of approximately 10 percent of the employees showed that a little more than half were harboring *E. histolytica*. Contamination of water and milk supplies at the employees' homes and of food served at the factory was ruled out by extensive investigation, Poole and his co-workers reported. They examined other possible sources of infection but obtained no significant data.

### *Dye Test Used*

Thus by exclusion, they said, the most probable cause of this outbreak was contamination of the plant's private water supply. The contamination was clearly shown, they reported, when dye placed in a sewer for experimental purposes appeared in the well water. Examination of the well apparatus, made as a result of the dye test, uncovered leakage in a pipe between the vertical turbine pump and a receiving tank into which the pump discharged well water under atmospheric pressure. The pipe was only five horizontal inches from the sewer, said Offutt and his group.

### *Unusual Epidemic*

Characteristic outbreaks of amebiasis, they said, are explosive in nature, affect a relatively large percentage of the exposed population, and are preceded by abnormal diarrheas if the major infection is one with more severe symptoms. The South Bend epidemic, however, was sporadic, confined, and often mild.

Although cases appeared as early as 1950, Offutt and his associates said their final tabulation shows there were never more than 1 to 3 new cases in any 1 week and only 22 cases during the 15-week period in 1953 when the epidemic was at its height. Clinical symptoms of amebic dysentery didn't always appear in infected individuals, they reported, but said that a majority of the cases under study were characterized by bowel movements numbering from six a day to fecal incontinence.

The outbreak was obscure in its early phases and there was a lack of immediate correlation between health department reports and the actual date of onset in many cases, said the Offutt group. As a result the existing epidemiological evidence was misleading and a retrospective study became necessary when the epidemic was recognized in June 1952.

# Planning and Administration . . .

*Undergoing constant reassessment is the extensive range of basic services provided by local and State health departments. Some of the refinements in program administration that have been developed are reported here.*

## Sanitation Programs Need Reappraisal

Local sanitation programs today are not being directed to the more serious health problems, according to Charles C. Spencer, M.C.E., director of the division of environmental sanitation, Erie County (N. Y.) Health Department.

In Spencer's opinion most such programs are still directed toward control of gastrointestinal diseases, which are now negligible in the United States, in spite of the fact that respiratory diseases make up a large proportion of the communicable diseases today. Home accidents require more attention, though it is difficult to define the usefulness of environmental measures to prevent them, he said.

### *Cooperative Planning*

To best contribute to the long-term development of an area, public health engineers in health departments must work very closely with local officials, and particularly with planning boards, Spencer declared. Although enforcement activities should not be neglected, time devoted to encouragement and development of communitywide sewer and water facilities or to the stimulation of voluntary housing improvement programs should be more valuable and productive in the long run, he added.

Sanitation workers in health departments as well as sanitary engineers must participate in community planning and design if their objectives are to be accomplished, Spencer continued.

"Ideally, one man should cover all aspects of sanitation in a limited district," he said, for by so doing "he becomes more familiar with local officials and with the needs and customs of a particular neighborhood which influence all aspects of sanitation. However, from a point of view of ad-

ministration and program direction, specialization in certain aspects of the work appears to be desirable."

The size of a staff should be based on density of population and the type and extent of the problems in an area rather than on the total population, Spencer stated.

Public demand for the services of a sanitation division is increasing, and although some of the community's problems are not always of immediate public health importance, the sanitation division is the only public agency organized to deal with them. On that basis, he purposes, that for administrative reasons it is probably well for the sanitation division to assign needed personnel to the health department. However, he cautioned, there should be an awareness of real public need as contrasted with public demand.

## Nurse Services Evaluated By New Record System

The mark sense system of reporting and tabulating nursing activities in the Erie County (N. Y.) Department of Health serves as an index of problem situations, according to Mary E. Jones, M.S., the department's assistant director of public health nursing.

The system, installed in 1951, is used to plan and evaluate programs, to adapt nursing services to community needs, and to supervise nursing performance, Jones stated. It has reduced the amount of nursing time spent on clerical work. About 10 to 12 thousand cards are handled monthly.

The new system is now being used for a 4-year study of a community by nursing area, Jones said. Data were collected on birth and death rates, population shifts, health services utilized, type of nursing service, and nurse performance. Analysis has brought about a concentrated effort on individual nursing contacts in certain census tracts. The study has served to emphasize services for preschool children, too.

Eventually, each nursing district will have similar information in looseleaf form, which will be kept up to date, she added.

The objective data collected makes it possible for the nursing supervisor to anticipate workloads, Jones continued. It has helped justify the demand for increased bedside nursing in one rural district, she said. Statistical tabulation of reports on nursing visits has produced a baseline of performance for the average nurse within each district, as well as baselines for field visits and school and clinic visits, she said. These are only quantitative, she cautioned, and must be used with other pertinent factors for evaluation.

The system operates as follows, Jones said:

The nurse checks the information concerning the specific activity performed on an individual card for statistical use. With the addition of the nursing notes pertaining to the content of the activity, a duplicate card becomes the service record.

All districts use the same card for reporting, punched by nurse number and card number before distribution.

After mechanical tabulation of the statistical cards, a report is available, monthly and quarterly, for each nursing district. It is tabulated on an administrative basis and on a service basis.

On an administrative basis, it shows the work performed by all nurses for a particular district office regardless of the district in which the service occurs.

On a service basis, it shows the amount of nursing work performed in a given district by any nurse.

## Detroit Cites Advantages Of Centralized System

Continuity of patient care and administrative economy and efficiency mark Detroit's centralization of all municipal health functions within the health department, according to Joseph G. Molner, M.D., M.P.H., and Vlado A. Getting, M.D., Dr.P.H.

Detroit's gradual consolidation of health functions is contrary to what they see as the prevailing trend of assigning health activities to several agencies.

Dr. Molner is commissioner of the Detroit Department of Health and professor of preventive medicine, Wayne Medical School, and Dr. Getting is professor of public health practices, University of Michigan School of Public Health.

In addition to the usual public health activities, they reported, the Detroit Department of Health administers the three city hospitals operated for the care of the needy sick and for emergency cases—the Herman Kiefer Hospital, containing the new 250-bed tuberculosis unit, and the contagious disease and maternity units; the Maybury Sanatorium for the tuberculous; and, since 1949, the 538-bed Receiving Hospital, and its 48-bed emergency branch, containing the general, psychiatric, and emergency units.

The consequent integration of hospital and medical home care for the indigent with the preventive program of public health is profitable to the city at large, the immediate recipients, the city officials, the practitioners, and the health department staff, Molner and Getting declared.

### *Continuity of Care*

As an example of program continuity, they cited tuberculosis control. The health department tuberculosis coordinator, they explained, is concerned with the entire program—case finding, health education, sanatorium admission, care, and discharge, and followup of the patient after discharge.

Prompt hospitalization of newly discovered cases, rapid examination of contacts in the hospital clinics, ease of transfer from the Maybury Sanatorium to the Herman Kiefer Hospital for surgery and back according to the patient's needs, earlier return home for continued anti-

microbial treatment when suitable, and periodic reevaluation in the outpatient clinic by the same agency—these were given as advantages accruing from undivided authority.

In addition to the secondary prevention measures of early detection and health education, Molner and Getting said, the Detroit Department of Health can practice primary prevention through BCG vaccination of newborn infants arriving at the maternity unit and by followup in the well child conference and in the tuberculosis outpatient clinic. These prevention measures reach a medically indigent group in which tuberculosis is more prevalent than in other groups in the city, they said.

Among the administrative advantages, they said, are the uniformity of personnel policies and records for the public hospitals and health divisions, pooled purchase of supplies, and centralized ambulance and similar services.

The potential problem in the division of the health officer's time between hospital administration and public health practice is minimized by the employment of administrative specialists, Molner and Getting indicated.

## Cautions Against Transfer Of Sanitation Inspections

The sanitation inspection program is a health department function and its transfer to other municipal agencies is at the jeopardy of health protection, the Committee on Municipal Public Health Engineering stated in its report.

Presenting the report was P. W. Purdom, director of environmental sanitation, Philadelphia Department of Public Health.

Improved administration of sanitation inspection programs can be achieved through better use of trained personnel within the health department and through the development and acceptance of reciprocity of inspections between health jurisdictions, the report stated.

The committee considered three problems in the administration of local health department sanitation inspection programs: transfer to central agencies outside the health department; generalization versus specialization within the health department; and overlapping inspections between health jurisdictions.

The report, in summary, stated the following:

Transfer of sanitation programs from health to other departments may result in loss of effectiveness in protecting public health.

Actually, consolidation of inspection activities does not take place when a central inspection agency is established because of technical complexities.

Sanitation programs function most efficiently and effectively under professional supervision charged with the primary responsibility to protect the public health.

Generalization of sanitation personnel within the health department can be utilized to a greater extent than previously practiced. Thus reduction of annoying duplication and improved efficiency of operation can be obtained.

Development of reciprocal inspection programs between health jurisdictions in an area where duplication of effort can be eliminated without hindering public health objectives. This deserves further study and implementation.

## The Sanitary Engineer In Public Works

How sanitary engineers in health departments contribute to the conception, design, improvement, and operation of public works in municipalities was described by Harold Romer, chief, division of waste disposal and pollution control, New York City, and Rolf Eliassen, professor of sanitary engineering, Massachusetts Institute of Technology.

Aroused by failures of home sewage systems installed since 1946, the New York City Department of Health in 1952 took over active supervision of home sewage disposal installations through an interdepartmental committee.

Another example of interdepartmental action described related to the special board created at the suggestion of the health department in 1943 to protect the public water supply of New York City.

The economies of large-scale operation of sewage treatment plants suggested further opportunities for health departments to require essential hydrographic studies and biochemical assays prior to approval of plans.

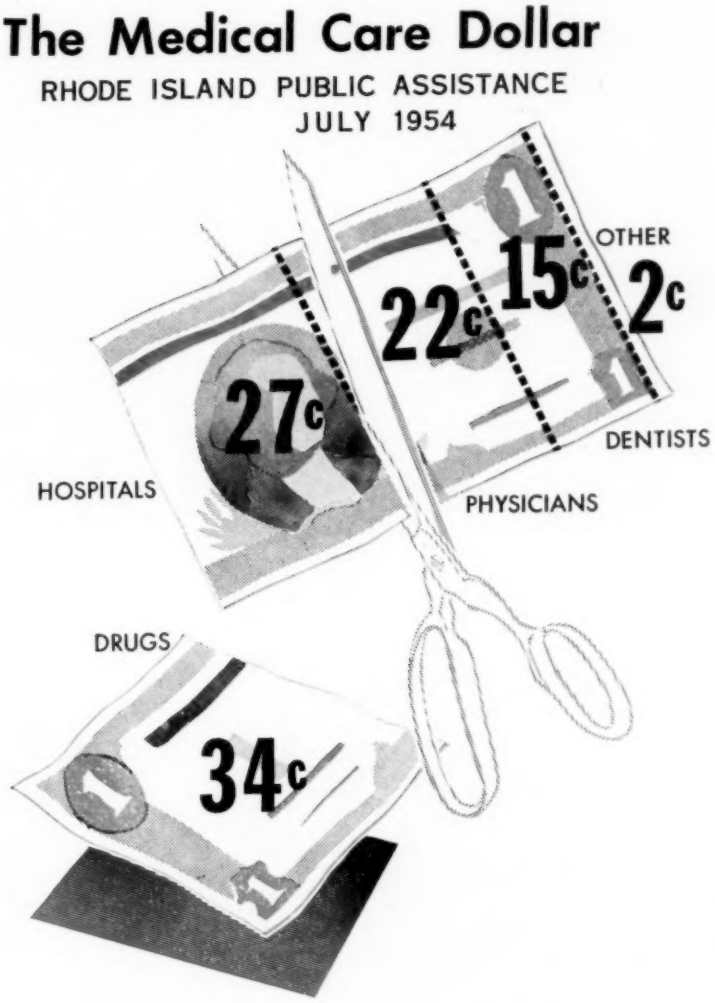
Brookline, Mass., was cited as an example of a municipality where public health engineering, backed by inspection and police powers of the health department, succeeded in improving waste disposal operations involving an incinerator and a land-fill.

In relation to the budget, Romer and Eliassen stressed that the engineers of the health department can be particularly helpful to other departments in demonstrating and justifying the need for funds adequate to employ trained personnel, to conduct studies essential to economical operations, to provide an adequate maintenance staff, and to operate important control devices.

They cited a common condition: lack of funds for maintenance of devices that prevent sewer overflow. Raw sewage then passes the obstructed control gates; the waters are polluted, and the greater part of the investment in the treatment plant is wasted.

## Rhode Island Stresses Basic Low Cost Care

Rhode Island emphasizes minimum adequate medical care for its public assistance recipients, according to P. Joseph Pesare, M.D., Dr.P.H., medical director, and John T. Tierney,




medical social work supervisor of the office of medical service, Rhode Island Department of Social Welfare.

In July 1954, a total of 31,240 public assistance recipients, 3.9 percent of the 1950 State population, were receiving medical care at an annual expenditure of about $1,300,000, Pesare and Tierney reported.

They explained that the medical care program is financed from a "pooled fund" made up by drawing from assistance funds a monthly amount for each assistance recipient. Federal participation in this pooled fund amounts to about 25 percent, they said. The monthly assessments per person or case in the Federally aided categories are: old-age assistance, $5; aid to dependent children, $7; aid to the blind, $6; and aid to the disabled, $9. The State public assistance office pays the sources of services and supplies directly from the fund, they explained.

### *Minimum Adequate Care*

Under the heading of "adequate" care, they said, is an extensive range of basic services and supplies provided within the framework of conditions set down by the department.

Listed were the services of private physicians, medical consultants, dentists, osteopaths, optometrists, opticians, and chiropodists, and diagnostic X-ray and X-ray and radium therapy, clinical laboratory services, surgical and prosthetic appliances, ambulance services, prescribed drugs provided by pharmacists, hospitalization, clinic care, convalescent and nursing home care, and home nursing services.

Under the "minimum" heading, they said, Rhode Island insists on public assistance that supplements personal and community resources, but does not supplant them. They also pointed out that the program does not provide luxury-type medical services to the patient and that special approval is required for extraordinary or expensive services and supplies.

For example, they stated, dentures cannot be authorized without consideration of the age of the patient, length of time the patient has been without dentures, condition of present dentures, and patient's attitude.

During one 30-week period, Pesare and Tierney reported, the total amount requested for dental care for adults in the Federally aided program was $69,172. After review by the department's dental consultants, about 52 percent was approved, 33 percent denied, and 15 percent left pending for future consideration.

Practitioner's fees paid by the State are lower than those expected of average income people who are paying for their own services, they said. The physician receives a maximum of $7 for a home visit and $9 for a boarding, nursing, or convalescent home visit regardless of the number of patients seen. The maximum all-inclusive rate for hospitalization is $14 a day.

### *Moderate Control*

Moderate administrative controls are used, they reported. Bills are accepted without prior authorization for physicians' visits up to 8 a month for an acute illness and 2 a month for a chronic illness. However, they said, all dental services, except for the immediate relief of pain, require written authorization.

Pesare and Tierney reported that the same medical care standards prevail throughout Rhode Island—for

the locally administered general public assistance cases as well as the Federally aided categories of assistance administered by the State.

Payment within 30 days for services and supplies, they believe, has contributed to the success of the program.

# Rehabilitation Programs . . .

*Amending legislation passed in 1954 has widened the scope of the Hill-Burton program to include nursing homes and rehabilitation facilities and has provided for the rapid expansion of the public vocational rehabilitation program.*

## Hill-Burton Amendments Include More Facilities

Nursing homes, chronic disease facilities, rehabilitation facilities, and diagnostic or diagnostic and treatment centers are now included in the Hospital Survey and Construction Program. Popularly called the Hill-Burton program, over the past 8 years it has approved projects providing more than 109,000 hospital beds and 483 health centers. The Public Health Service joins individual State agencies in administering the program.

According to John W. Cronin, M.D., chief of the Division of Hospital Facilities, Public Health Service, the expanded program offers a wide range of services for the chronically ill and the physically and mentally impaired. For rehabilitation facilities, emphasis will be on integrated medical, psychological, social, and vocational evaluation and services under competent professional supervision.

Legislation enacted in 1954 (Public Law 482, 83d Cong., 2d sess.) provides for fact-finding surveys to define needs of communities for rehabilitation facilities, as a prerequisite to developing State plans to meet these needs, Cronin said. Survey and planning grants are available to States on a dollar-for-dollar matching basis until expended.

In addition, grants to construct and equip rehabilitation facilities are authorized for the statutory life of the existing program—through fiscal 1957. The rehabilitation facility need not be part of a hospital, a revision contained in the new legislation. Funds allotted for rehabilitation purposes may not be transferred to funds allotted for other categories, but this provision does not apply to funds for chronic disease hospitals, nursing homes, and diagnostic or diagnostic and treatment centers. The new amendments also provide for maximum and minimum allotments.

### *Community Initiative*

Essentially, the broadened program will operate like the original one, Cronin explained. Initiative for building facilities and their operation rests with each community. Each project is approved according to a State plan. Federal contributions range from 33⅓ to 66⅔ percent of the total project cost, as determined by the respective States.

Cronin noted that the act's integration features have important implications for interprofessional collaboration and performance. Its provisions give added impetus to community health planning and health promotion and chronic disease control, he added.

Experience has indicated that no blueprint can be imposed upon any community, Cronin stated. Community rehabilitation projects, he said, might grow out of, or be centered in, a hospital rehabilitation program. They might be part of a broad chronic disease control plan. They might be sponsored by social agencies, workmen's compensation agencies, or a combination of agencies interested in problems of the disabled. Under the new amendments, two or more States may pool Federal grants for construction of a facility.

## Rehabilitation Program Hinges on Manpower

The success of the recently expanded Federal program for rehabilitation will depend upon the total available supply of qualified personnel, declared Catherine A. Worthingham, Ph.D., D.Sc., director of professional education, National Foundation for Infantile Paralysis, Inc., New York City.

Defining rehabilitation as total patient care rather than a specific group of techniques, Worthingham emphasized that a team of persons, including the patient, is needed if complete rehabilitation is to be achieved.

In addition to the physician and other professionally trained persons—nurse, physical therapist, occupational therapist, medical social worker, clinical psychologist, and vocational counselor—the family, the teacher, the religious leader, and the employer may be needed to complete the rehabilitation team, Worthingham stated.

The specialties and the type of rehabilitation facilities will vary in each case, depending on the patient and on the situation. Treatment

may be possible at home, or the services of a hospital or any of a large number of community services may be required.

In metropolitan areas and in medical teaching centers, rehabilitation centers, providing equipment and services at a centralized location, will be needed, Worthingham said, but in small communities, provision of complete facilities and personnel for small groups of patients is too expensive. Such areas must depend upon cooperation and communication between various types of rehabilitation facilities.

**Existing personnel and increases needed for rehabilitation services in 5 fields**

| Type of personnel | Number available | Immediate increases needed | |
|---|---|---|---|
| | | Number | Percent |
| Nurses | 350, 000 | 50, 000 | 14 |
| Physical therapists | 6, 000 | 2, 500 | 41 |
| Occupational therapists | 4, 000 | 2, 900 | 72 |
| Medical social workers | 3, 300 | 1, 000 | 30 |
| Vocational rehabilitation counselors | 1, 200 | 500 | 41 |

### *Use of Professional Personnel*

According to Worthingham, immediate increases in personnel are needed in all fields essential to rehabilitation. The accompanying table shows these needs in five important fields.

Present estimates of personnel needs do not include statistics on employment or job vacancies except for hospital programs, Worthingham stated, and it cannot be determined how many employees are devoting their entire time to services for which they were trained. Nonprofessional personnel frequently can perform services for patients that will free professional personnel for the services that require professional training.

The maximum use of existing personnel is at best a stopgap, she believes. Concentrated effort must be made, therefore, to increase the number of students entering training and the capacity of schools to receive them, at the same time sparing no effort to protect the standards of education and practice, she said.

Personnel shortages in each field should be studied. Determination is also needed as to what these services are and what types of nonprofessional personnel can perform them. A balanced distribution of existing personnel in teaching, in programs emphasizing prevention of disability, and in programs for care of the severely handicapped is also important, she said.

In closing, she stated that "orientation courses for existing personnel should result in better utilization of available manpower," and that "scholarships for students and financial assistance to professional schools is the only way to increase the manpower for rehabilitation services without sacrificing the quality of those services."

## Vocational Rehabilitation Expanded by New Law

By the unanimous passage of amending legislation, the Congress has provided for the rapid expansion of the public vocational rehabilitation program.

Terming the program an investment in human welfare that is self-liquidating, Joseph Hanford Gerber, M.D., Dr.P.H., chief medical officer of the Office of Vocational Rehabilitation, outlined the main provisions of this new legislation which became Public Law 565 (83d Cong., 2d sess.) in August 1954.

As a result of its passage and supplemental appropriation legislation, States have increased latitude and increased Federal support with which to operate their rehabilitation programs, Gerber indicated. The new legislation provides for:

Research into the techniques and practice of social restoration of the disabled.

More facilities for the assembly of the necessary rehabilitation services.

Training of essential professional personnel.

Creation of a national advisory council on vocational rehabilitation.

The entire range of rehabilitation services provided under the program since 1943 is continued.

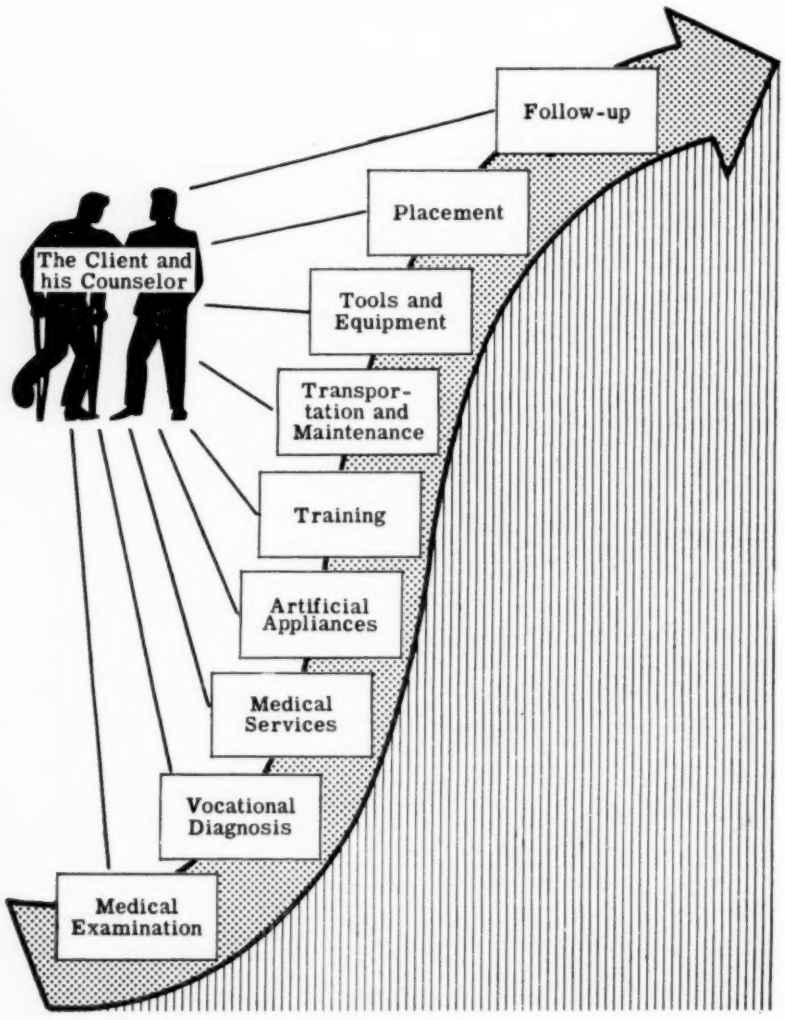
### *Since 1920*

The public vocational rehabilitation program has been a Federal-State partnership from its inception in 1920, with the States operating their own service programs, Gerber said. In 1943, physical restoration services were added to the original program of job training, guidance, placement, and the purchase of prosthetic appliances, thus making it possible for the States to correct or minimize the disabling condition. With annual increases in appropria-

**Number of persons served and number rehabilitated, 1944–53**

| Fiscal year | Persons served | Persons rehabilitated |
|---|---|---|
| 1944 | 145, 059 | 43, 997 |
| 1945 | 161, 050 | 41, 925 |
| 1946 | 169, 796 | 36, 106 |
| 1947 | 170, 143 | 43, 880 |
| 1948 | 191, 063 | 53, 131 |
| 1949 | 216, 997 | 58, 020 |
| 1950 | 225, 724 | 59, 597 |
| 1951 | 231, 544 | 66, 193 |
| 1952 | 228, 481 | 63, 632 |
| 1953 | 221, 847 | 61, 308 |

**The rehabilitation process. Counseling and guidance is the core of all services.**




tions, the number of disabled persons returned to gainful employment has rapidly increased.

No disabled person is considered to be rehabilitated until he has been placed in suitable employment, after being provided with substantial rehabilitation services, he continued. For services other than diagnosis, counseling, training, placement, and followup, the individual is expected to contribute to the cost according to his ability.

Gerber said the increased support to the States is provided by the new legislation in three types of Federal grants-in-aid:

The basic support grant—allotted to the States on the basis of population weighted by per capita income.

The extension and improvement grant—allotted to the States on the basis of population. These funds are to be used for projects which will provide better vocational rehabilitation services. The Federal share may be 75 percent of the total cost of a project for a maximum period of 3 years.

The special project grant—made to States and public and other nonprofit agencies for the purpose of paying part of the cost of research projects, demonstrations, training and traineeships; and for projects to establish special facilities and services which hold promise of making a substantial contribution to the solution of vocational rehabilitation problems common to all or several States. In 1955 every $2 of Federal money must be matched by $1 furnished by the project sponsor.

## Higher OASI Benefits Reduce Public Aid

The reduction in public assistance caseloads and costs resulting from the 1954 Social Security amendments were emphasized by I. Jay Brightman, M.D., M.S.P.H., in his discussion of the increase in Old-Age and Survivors Insurance benefits and the extension of the program to large new groups.

Dr. Brightman, assistant commissioner for welfare medical services, New York State Department of Health, noted that in February 1954 more than 460,000 aged persons were receiving both old-age assistance payments and OASI benefits. Many insurance beneficiaries, he pointed out, have required supplementary assistance if they receive minimum insurance benefits and have few other resources.

The increase in insurance payments has already permitted supplementary assistance to be discontinued for many beneficiaries, and a further decrease is expected, he said. Brightman also reported a decrease in caseloads and costs in the aid to dependent children category of public assistance.

Brightman believes that the higher degree of financial security offered by the insurance benefits based on the worker's own contributions, augmented by interest and dividends from previous savings and securities, and the current earnings allowed up

to $1,200 a year, will have a significant effect on public health. Financial security should provide for a better emotional adjustment and decreased stress in the later years, and thus should become a potential force in reducing the prevalence of psychosomatic aspects of chronic illness, he explained.

For the less advanced forms of both mental and physical illness, financial security may permit an aged person to provide the necessary services for himself and increase his chances of remaining in his own home or the home of friends and relatives rather than being institutionalized, he said.

The OASI amendment preserving the insurance rights of persons who become totally disabled before they have established permanent eligibility, Brightman believes, will stimulate interest in the rehabilitation of the disabled insurance beneficiaries whenever possible.

# On Healthful Housing . . .

*Housing code enforcement succeeded in remedying at reasonable cost substandard dwellings in a Baltimore area, a pilot study in housing rehabilitation finds. Prevention of blighted areas is also advocated in papers on planned inspections, communitywide planning of workers' new homes, and a PHS training course in housing hygiene.*

## Baltimore Housing Study Weighs Effects of Code

While modest rent increases may be expected from enforcement of a housing code in a housing rehabilitation program, the increases are not so large as to force low-income families to move, according to the results of the first detailed study of housing quality "before" and "after" rehabilitation.

The study, made in Baltimore, was reported by Ralph J. Johnson, M.S., chief, and Roy O. McCaldin, M.S., assistant chief, Housing Hygiene Activities, Division of Sanitary Engineering Services, Public Health Service, and Huntington Williams, M.D., D.P.H., commissioner of health, Baltimore City Health Department.

The scale of the study was not large, and the conclusions cannot be assumed to be representative of housing rehabilitation in other cities or even in other parts of Baltimore, they warned, but if the basic information is carefully considered, it may provide an indication of what may be expected in other communities.

The Public Health Service provided general direction for the study, supervision of the field work, and prepared the analysis of the data; the Baltimore City Health Department provided the enumerators and related data and assistance, they reported.

Other conclusions cited from the study data were:

Compliance with minimum health and safety standards for substandard housing is possible without a directly proportionate rent increase since rent and housing quality were not found to have a reasonable relationship to each other either before or after rehabilitation.

Housing code enforcement resulted in significant improvement of the housing quality by making the dwellings healthier and safer places to live. The improved maintenance should also prolong the usefulness of these houses.

### *The Study Procedures*

The housing quality of the pilot study area was measured by the American Public Health Association's Appraisal Method for Measuring the Quality of Housing, which uses a penalty scoring method.

The "before" survey was made in May 1951, and the "after" survey in October 1952. In 1951 the survey area contained 1,042 dwelling units in 25 adjacent blocks, and the score was completed on 989 units. In 1952 the area contained 1,017 units and 976 were scored. About 90 percent of the units not scored were vacant, Johnson and his colleagues reported.

The 1952 survey was made after 18 months of enforcement effort. About 56 percent of the enforcement cases were already closed and most of the remainder were completed. Work in progress during the 1952 survey was given full credit in scoring, they said.

### *Results*

The Batimore Housing Code and related regulations did not, during the survey period, establish the same standards or even cover the same items used in the appraisal method, which, for the most part, is based on higher standards.

The study group reported the following results:

The average total dwelling score improved about 36 percent; facilities improved about 13 percent; maintenance, about 74 percent; and the occupancy improvement was not statistically significant.

The average gross rent increase amounted to $5.70 from $48.20 to $53.90 per month. During the same time the median income of the families in the study area increased from $239 to $259 per month. Owner occupancy remained at 41 percent.

## Plan Workers' Homes With Plant Expansion

In many communities, comprehensive planning for the home life of all segments of the area's population has not kept pace with the planned industrial growth of the community, according to Earl W. Smith, chairman, research institute, National Association of Home Builders, Washington, D. C.

Most communities have zealously developed their dreams of plant expansion but "all too frequently have turned their back" upon the problem of community facilities and the suitable within-income housing needed by the varied groups of workers induced to the neighborhood by new jobs, he said.

Physical and mental health, in a major sense, are affected by the home and community environment and the financial burden encountered there, Smith said in discussing the problems of growing communities.

Community residential areas should offer proper opportunity for comfortable housing, ample recreation opportunities, and community facilities, within the economic means of each income group, he said.

Smith asserted that the average worker can afford, without much possibility for future worry, to buy a home in the $8,000–$10,000 price range, amortized at 25 years. The economic well-being of the worker and his family has a considerable influence on the mental and physical well-being of that family, he said.

The revenues of the average community have not been sufficient to expand community facilities to accommodate the growth of the area. As a result, new residents have been penalized by being forced to carry an excessive burden of cost for facilities which are used by the entire community.

Smith illustrated how the builders of new homes have been forced to pay for construction of wide boulevards, sanitary installations, storm sewers, and water and utility mains. This cost is then apportioned to each new home purchaser. Such expenses make it practically impossible in many areas to provide homes for the low-income worker.

### *Problem Evaluation*

Community leaders and planners should arrest this exorbitant price trend which is threatening a shortage of housing for families in the low and modest income groups, cautioned Smith. Communities expanding their industrial and commercial areas must plan proper locations for good, sound homes for workers in the industrial and commercial developments. Community facilities must be expanded with a fair distribution of cost.

Smith recommended the organization in each community of a citizens' advisory group to evaluate the area's problems. These groups should plan community action for the benefit of all residents in scale with the economic means of each. Representatives of each segment of the population as well as the industrial and professional factions should serve on this advisory group and give direction to the planning technicians.

The community's strength, he said, will be equal only to its resolve to deal honestly and energetically with the problems confronting it.

## Says Planned Inspections Lead to Better Housing

Not all substandard housing in urban areas can be corrected by the handling of nuisance complaints in the health department, according to Andrew T. Dempster, Jr., M.P.H., director, bureau of sanitary engineering, Detroit Department of Health.

He believes that the best method of improving housing conditions is through preventive rather than corrective programs of housing sanitation.

Dempster recommended that the city health department establish minimum housing standards and conduct a housing survey on a house-by-house, block-by-block basis. Violation or corrective notices should be issued listing all deficiencies found and setting a time limit for compliance, he said. Enforcement measures should include inspections, hearings, and, as a last resort, court action.

Planned inspections can prevent or eliminate poor and dangerous conditions before they develop, he observed. An added advantage in establishing minimum housing standards, he pointed out, is that they can be applied to all new construction by examining plans before dwelling permits are granted.

### *Pinpointing the Areas*

Detroit pinpoints the location of housing complaints on a city map to aid in the selection of substandard areas, Dempster said. Pinpointing also points the way to other environmental health problems.

At best, nuisance or housing complaints can never be completely anticipated or eliminated, but if recorded and given the proper attention, they will aid in preventing or solving many serious housing problems, he said. If carefully evaluated, they will provide information for the enactment of the minimum housing standards and on the existing housing problems. Analysis of the complaints will also help in conducting housing improvement projects.

Dempster defined nuisance complaints received in the health department as the reporting of unhealthful situations or practices that endanger the health or safety of others. Most complaints fall into three categories, which he listed as: (1) the sanitation of the dwelling unit or its environment; (2) the lack of facilities such as toilets, lavatories, living space, lighting, or ventilation; and (3) the general maintenance of the dwelling units or facilities.

Most complaints are found to be justified when investigated. Many are seasonal, and the majority are

telephoned. This practice is preferred in Detroit over written complaints because it offers an immediate two-way communication, saves much time and paperwork, and may eliminate the need for inspection, particularly when the complainant is merely seeking advice, Dempster said. All complaints however received should, of course, be properly recorded.

## That New Look in Housing Shows Healthy Attitude

The new look in housing points to acceptance by health officers of their responsibility in housing hygiene, said Ross W. Buck, in describing the Public Health Service program for training housing experts at the Communicable Disease Center in Atlanta. Mr. Buck is chief of the CDC Housing Sanitation Unit.

Richmond, St. Louis, Denver, Detroit, and Milwaukee, and other cities have recognized that the success of comprehensive housing programs depends on effective leadership and effective community organizations, he stated.

The trend toward increased health department participation in housing is encouraging, even though late, he said. Health departments should start thinking in terms of preventing blight rather than handling complaints. If they are prepared to assist city planners, redevelopment agencies, and welfare departments, they will have ready the necessary facts, the procedures for collecting and evaluating the facts, and the personnel to do the job.

### *Training in Housing Hygiene*

At the Communicable Disease Center, a 5 weeks' training course is conducted every 2 months for responsible persons interested in housing programs. The course is open to various city, county, State, and Federal organizations. Most of the trainees are from health departments, but some are sponsored by planning commissions, building inspection departments, and private enterprise.

Upon completing the course, for which no charge is made, the trainee is certified in the use of the appraisal technique—a method for objectively measuring the quality of housing, which was developed and approved by the American Public Health Association's Committee on Hygiene of Housing.

In addition, the curriculum includes discussions devoted to basic principles of health and housing; local customs and laws and regulations now in successful use; home accident prevention; development of housing ordinances and enforcement programs; planning, zoning, and Federal legislation; and the use of sampling in surveys.

The training program attempts to fit the learning situation to the trainee. Material is sent to the prospective trainee in advance so that he will understand the program. The sponsoring agency should select the most suitable person for this special training, give him adequate notice of his selection, and apprise him of the opportunities in this field and the assistance which he can expect from other individuals, Buck stated. He added that health departments should look for the qualities of high morale, initiative, enthusiasm, and interest in dynamic housing hygiene among the trainees they select. A background in public health education, engineering, law, or public administration and planning is almost an essential for most applicants, he said.

# Professional Education . . .

*Training in mental health for teachers and health officers; field training for prospective health education teachers, as well as public health dentists; need for more emphasis on medical care in professional schools; tests to evaluate students' progress; and a report of a study of costs of nursing education are the subjects of this series of papers.*

## Nursing Education Costs Are Being Studied

There is "urgent need" for a method of analyzing nursing education costs "as an indirect means of expanding and strengthening the administration of collegiate programs," declared Leslie W. Knott, M.D., M.P.H., and Eliwynne M. Vreeland, R.N., M.A.

The nursing profession estimates that the proportion of nurses with college education needs to be increased from the current 8 percent to 25 percent if shortages in teaching, administration, and other specialized fields of public health nursing are to be overcome, they stated.

Dr. Knott, Division of Public Health Methods, is executive secretary of the Public Health Service Manpower Committee, and Miss Vreeland is a nurse consultant in the Service's Division of Nursing Resources. Dr. Knott and Miss Vreeland are director and nurse consultant, respectively, of the joint study of methods for determining the costs of basic collegiate nursing

education programs, sponsored by the National League for Nursing and the Public Health Service.

### *More Data Needed*

To determine the cost of collegiate nursing education, the speakers said that more data are needed on:

The portion of general expenditures and the portion of expenditures for instructions that can be charged to nursing education.

The monetary value of all contributions from agencies participating in college nursing education.

The cost of the contribution of the school of nursing faculty to other hospital functions and to community service.

The cost of nursing education per student.

The part of this cost covered by tuition, student service, and other income.

When these questions are answered, the extent to which the data can help in estimating the cost of establishing new collegiate programs may be determined.

Few schools are able to answer these questions, the authors continued. "In view of the mounting concern over these special problems," they said, it was decided to study possible methods for determining the cost of basic collegiate nursing education in the university, including the hospital, the public health agency, and other participating groups.

In addition, they said, a manual is to be prepared describing a practical method of analysis by which the schools of nursing and their associated agencies could obtain firsthand knowledge of direct and indirect costs.

Twenty-eight general and special hospitals, 17 public health agencies, and 6 colleges and universities—the Loretto Heights College and the University of Colorado, Denver; Emory University, Atlanta; Skidmore College, Saratoga Springs, N. Y.; Syracuse University, Syracuse, N. Y.; and the University of Washington, Seattle—are participating in the project by testing tentative cost analysis methods developed for the study, Knott and Vreeland stated. They reported that the deans of these schools and their associates would hold a conference in December 1954 to discuss the soundness of the methods used in the schools, and that a manual based on their experiences is to be published in 1955 for use in a large number of colleges.

Because of their participation in collegiate training programs, public health nurses are deeply interested, particularly in the relation of this cost to public health nursing, Knott and Vreeland said. In conclusion, they stated that, although the answer to the question of determining the cost of collegiate nursing education is yet to be found, it is believed "that a reasonably sound method is emerging and the indications are that it will achieve its purpose."

## Education on Medical Care Needs Investigating Spirit

For a disease as thoroughly worked over as tuberculosis, not even rudimentary knowledge exists of what might be called its "economy," despite the quantities of information available on costs.

In discussing professional education and medical care, the president of Johns Hopkins University, Lowell J. Reed, Ph.D., said the same gap applies still more strongly to knowledge of illness in general.

Professional schools—those of medicine, dentistry, and nursing—need to extend the student's knowledge concerning the subject of medical care so that he can approach the problem from the population point of view, with the involved interactions which this means, he observed.

"We need to know how a given illness, or illness in general, affects the society, and conversely the ways in which social organization and behavior affect illness," he said.

Reed used the phrase "medical care" as meaning "an organized program having as its objective the prevention, diagnosis, and treatment of illness in the population, rather than in the individual."

He described the linking of medical care, in this context, with education as, first, acquainting professional students with organized health programs within health departments, labor unions, group clinics, and the like, and then preparing them for future participation, with their specific skills.

The professional school's concern, he said, should be with those factors and elements of medical care that have some bearing on all the professions, not on those specific to a particular profession.

### *What to Teach*

That the need to know how illness in general, or a given illness, affects the society, and the reverse, was pointed up by the President's Commission on Health Needs of the Nation, according to Reed, also a member.

He commented that the fourth volume of the commission's report is the best existing compendium of information on this subject, but that it still lacks synthesis. Spotting these gaps in knowledge would be a challenging intellectual exercise, he observed.

What can universities teach when they are faced with a lack of an organized body of knowledge about medical care, Reed questioned.

Any of the subject matter now being presented in seminars, lectures, or field experiences pertinent to this field can be taught, he stated, pointing out that school administrators should be chary about teaching which might tend to solidify methods of medical service based on too little experimentation.

"All that I ask is that it be approached in the spirit of investigation on the part of both student and teacher," he said. The teacher, in presenting any specific idea, observation, or experience, should at-

tempt to answer the question as to where the experience fitted into the organized pattern of such knowledge, he suggested. Reed noted that almost without exception the highly successful programs touching on the field of medical care are associated with inspired teachers—those capable of lifting this material from its unorganized state and dramatizing it.

## Urges Tests That Reflect Students' Real Progress

We must use tests which require our medical students to think and reason if that is our objective, said John T. Cowles, Ph.D., professor of psychology and assistant for personnel services, School of Health Professions, University of Pittsburgh.

Urging professors of preventive medicine to concentrate on the defining of educational objectives so that more adequate evaluative tests can be devised, he also said:

"To make real progress in medical education, whether through the day-to-day trial of a new teaching method by a single professor, or through much more elaborate experiments in curriculum revision involving interdepartmental coordination, we can never know that our steps are forward rather than backward except through carefully planned use of sound evaluative techniques."

### *Need Improved Techniques*

In Cowles' opinion, the burden of evaluating a student's progress or final proficiency in the practice of preventive medicine falls upon the individual school, department, or professor, who can best solve the problem of adequate measurement by going beyond testing accumulated knowledge to using valid tests of complex skills and the nebulous factors that make up a personality.

Using clever questions, the newer objective tests now test the critical interpretation of experiments, the solving of practical problems, the use of relevant versus irrelevant data, the adducing of hypotheses and their testing, and even the subtler points of diagnosis, treatment, and prognosis from unfamiliar case histories, he continued.

Cowles recommended that existing selection or achievement tests, such as the medical college admission test, the tests of the National Board of Medical Examiners, or other tests of reasonable promise, be given a thorough trial. Where written objective tests cannot serve, real effort should be expended to devise new kinds of evaluation measures, he said.

Teachers of medicine should participate closely in the construction of their own everyday evaluation instruments and make bold attempts to use the newer objective techniques, he believes. These, he said, should be as objective as possible, as statistically and educationally sound as can be assured by available criteria, and also practical and meaningful from the school's standpoint as well.

The great need for improved testing techniques, Cowles noted, was voiced by the 1952 Colorado Springs Conference on Preventive Medicine in Medical Schools and the 1953 teaching institute of the Association of American Medical Colleges.

## Field Training Essential For Public Health Dentist

To provide public health dentists with a working knowledge and practical experience in dental public health administration, field training must become an integral part of graduate education, declared Philip E. Blackerby, Jr., D.D.S., M.S.P.H., director, division of dentistry, W. K. Kellogg Foundation, Battle Creek, Mich.

Opportunities for field training are not now available, he said, but organized attempts to make a systematic study of the problem and to formulate plans for its solution are under way.

The fundamental objectives of field training are to provide students with a working knowledge and practical experience in general and dental public health administration, Blackerby stated.

An educational agency should have the primary responsibility for the planning and general supervision of a field training program, he said, and this institution should work closely with the service agency which functions as a training center. The responsibilities which each agency is to assume should be clearly defined, he said.

### *Training Facilities*

Suitable facilities will be needed to carry out both the individual and the joint responsibilities of the school of public health and the field training center, Blackerby said. He suggested that the facilities of the field training programs operated by most of the States for other public health personnel be used for training public health dentists.

The centers selected should be desirably located geographically; supervised by a preceptor, preferably affiliated with the school of public health, who has the experience, interest, and capacity to train personnel; and have a suitable training program and a staff willing to evaluate and report on the progress of the trainees.

Problems to be solved will include financing the training center and at least partially subsidizing costs to the trainees, Blackerby stated. He suggested that State health departments be encouraged to develop field training centers for dental personnel and to give greater attention to dental public health in the field training experiences offered to other types of public health personnel.

He also suggested that schools of public health take a more active and direct interest in the organization and conduct of field training programs, both intra-academic and post-academic, for public health dentists

and for other categories of public health personnel, and that one or more pilot programs be established in selected States.

## Dental School in London Rearranges Curriculum

Recent rearrangement of the 5-year course offered by the London Hospital Dental School represents a true experiment in undergraduate education, declared A. M. Horsnell, F.D.S., director of conservative dentistry at the school and dental subdean, London Hospital Medical College.

The children's dressership follows, for all practical purposes, immediately after the year of basic sciences, although it is actually preceded by an introductory course, in which periodontology, clinical examination routine with children as patients, instruction in local anesthetics, and a modified phantom-head course are given concurrently, Horsnell stated. Thus, students will continue directly from their study of physiology, anatomy, and embryology to the clinical observations of growth and development.

Under the plan, the students will be introduced in a logical way to dental pathology as it progresses in the mouth, he explained. Some 18 months to 2 years after they have completed their study of the basic sciences, when they know about preventive dentistry, periodontology, and restorative procedures, they will be taught dental prosthetics. They will then have a year or more in which to practice all aspects of dentistry concurrently. Dental mechanics, he said, will be taught as an adjunct to clinical prosthetics.

According to Horsnell's review of developments leading up to this arrangement, one important feature is the placement of the children's dressership early in the curriculum. Study of the traditional program, in which this dressership came late, indicated that the students were merely fulfilling the minimum requirements and that only in isolated instances did they or their young patients gain any real benefit from the dressership. "We began to wonder whether this placement of the dressership was giving the impression that there must be something difficult about the treatment of children," he said.

Horsnell reported that some 2 or 3 years ago pedodontics was made the first dressership, with the following results: These trainees have shown by far the greatest aptitude for children's dentistry; the patients have received their dressers with greater enthusiasm; more complete treatments and followups have been accomplished; and, incidentally, these trainees have turned out a much higher quality of general restorative dentistry.

### *Postgraduate Education*

Another postwar development of particular significance is the increase in postgraduate study, Horsnell maintained. In this connection he mentioned the establishment of the Institute of Dental Surgery, which is closely associated with the London University, the Royal College of Surgeons, and the Postgraduate Medical Federation, and he noted that the Royal Colleges have established their own dental faculties and examinations for the fellowship in dental surgery.

The National Health Act of 1948, he reported, made provision for persons engaged in its service to attend postgraduate refresher courses, such courses to be given by the universities in conjunction with the Ministry of Health. These courses have the support of the British Dental Association and are getting under way, he said.

### *Awareness of Dental Health*

As a factor related to dental education in Great Britain, Horsnell emphasized the increased awareness of dental health on the part of the population, with a concomitant increase in the demand for treatment. "Under these circumstances, the number of applicants now seeking entry into our schools cannot be considered satisfactory," he stated.

Horsnell also emphasized the intimate relation between recruitment and dental education in its broadest sense. "A fuller appreciation by the public of the benefits of dental health and the cost of dental disease automatically produce a greater demand for trained personnel," he said. "Greater dental consciousness would raise the status of the profession, and if the status is raised, there is little doubt that the number of recruits would similarly be raised."

He pointed to "good treatment to the proper section of the population" as the surest way to educate the public in dental matters, and he indicated that children represent the proper section of the population.

## Stresses Field Experience For Training Teachers

How professional laboratory experiences are being used to equip prospective teachers in health education was the topic of a report from Edward B. Johns, Ed.D., associate professor of health education, University of California, Los Angeles.

The concept of laboratory experiences in education, Johns explained, is best clarified in the definition prepared by the American Association of Teachers Colleges:

"Professional laboratory experiences include all those contacts with children, youth, and adults (through observation, participation, and teaching) which make a direct contribution to an understanding of individuals and their guidance in the teaching-learning process."

Johns noted that one result of these experiences is greater participation in community activities on the part of teachers. He remarked that between 40 and 45 teacher education institutions today offer cur-

riculums to prepare school health education personnel, a significant trend which is highly endorsed.

From a 1953 survey of 34 institutions having such curriculums, Johns selected these indicators of the need for more purposeful laboratory experiences (they are based on data classified under three categories—laboratory experiences prior to student-teaching, experiences during student-teaching, and community field experiences):

The lack of understanding of the school health program on the part of administrators is a major problem.

The procedures utilized before and during student-teaching are in accordance with accepted educational standards.

More than half of the institutions surveyed have a course on field experiences in health education or they include, in other courses, actual work experience in the community. The other institutions are depending on observation of community health agencies as their chief type of field experience.

There is need for the inclusion of additional laboratory experiences and for improvement in the quality of present experiences in the three categories, but particularly in the area of community field experiences.

A large majority of the institutions stated that they plan to increase their offerings in field experiences in the near future.

## Washington Health Officers Find Institute Stimulating

Institutes are an effective method of imparting to public health officers knowledge concerning interpersonal relationships and the influence of emotional factors in disease processes, according to Herbert S. Ripley, M.D., and Leland E. Powers, M.D., M.P.H. In addition, staff relationships may be improved by the change in views and attitudes, they said.

Dr. Ripley is professor and executive officer, department of psychiatry, University of Washington School of Medicine, Seattle, and Dr. Powers, formerly professor and executive officer in the university's department of health and preventive medicine, is with the department of preventive medicine and public health, American University of Beirut, Beirut, Lebanon.

Interest in mental health as a part of public health and preventive medicine has increased during the last few years, they said, and teaching institutes have been held from time to time since 1948.

### *Organization*

The mental health institute held at the University of Washington in Seattle in 1950 was attended by 39 public health officers, they reported. The students were organized into small discussion groups, each led by a public health administrator and a psychiatrist.

Orientation discussions by the teaching staff were followed by attendance at medical wards of the county hospital, wards at the tuberculosis sanatorium, clinics, and informal seminars. In the evening there were informal discussions and debate on subjects such as the relationship of the health department to the general public and to the schools, the churches, private and governmental agencies, and physicians.

Replies to questionnaires sent to all participants a year after the institute was held indicated that the students were satisfied with the general methods used in conducting the institute and that the attitudes and knowledge gained had been widely applied in their daily work, the speakers reported.

Informal personal visits to 13 health departments suggested that "changes that cannot be accurately measured had occurred with a trend toward more skill and understanding in dealing with individuals and groups, better staff morale in the health department, improved atmosphere in clinics, closer relationship with the community as a whole, and better appreciation and utilization of available facilities."

The questionnaire revealed that the participants overwhelmingly favored the centering of institute discussions around patients, allocating more time for informal discussion than to clinics, and a maximum 1 hour a day formal lecture session. The participants also felt that 7 to 10 days should be set aside for an institute, and that the participants should decide how much time should be spent in clinics and for discussion of a particular problem.

Ripley and Powers said that the State and Provincial health directors who had observed the participants for 2 years reported that at least two-thirds of them had benefited from the experience. They also reported that at a 3-day refresher meeting held in 1953, two-thirds of those attending had been students at the original institute in 1950. The participants in the refresher institute showed a vital and active interest throughout the meeting, and there was a unanimous expression that the institute had been stimulating, interesting, and helpful in carrying forward professional responsibilities.

## Cincinnati Health Teachers Get Inservice Education

Health teachers participate in all phases of Cincinnati's inservice teacher education program, which ranges from extracurricular committee work to professional and cultural study with academic credits, said William K. Streit, Ed.D., director of health and hygiene in the city's public school system.

Cincinnati's program is unusual in that there is no released time for committee work, Streit said. The program places major emphasis on committee work to which members of the school staff contribute their

ideas. These activities include curriculum revision, teacher self-appraisal, appraisal of textbooks, teaching materials, and visual aids as well as many opportunities for child study and self-development through workshops, institutes, preparation of publications and scripts, and specially planned meetings.

Teacher committees have helped develop Cincinnati's health courses at various school levels, he said. In this, they have outside cooperation from the health department, the Academy of Medicine, the Public Health Federation, representative parents, and various health and welfare organizations.

Textbook committees, working at four grade levels in health, evaluate textbooks for curricular criteria, authorship, organization of content, motivation, style, vocabulary, illustrations, and format, he said. Publishers, as well as the city's board of education, are guided by these recommendations, he said.

Three subcommittees appraise supplementary teaching materials in the field of health, Streit said. As a combined committee, in 1953–54 they previewed 421 health and safety films and graded and grouped the films according to units of study. This group also works with the Visual Aids Exchange and the Museum of Natural History in Cincinnati in appraising models and charts for health teaching.

Health teachers took a 40-hour course in driver education in 1953–54 because this phase of safety has been incorporated into the 10th grade health program, he said. Also, at the annual 4-day teachers institute, 4 sections of interest to health and safety teachers were scheduled.

## Mental Health Stressed In Teacher Training

The emphasis in on-the-job-training programs has shifted in recent years from subject matter and teaching techniques to the teacher's relations with pupils, parents, and the community, according to Jennelle Moorhead, M.S., associate professor in the general extension division of the Oregon State system of higher education.

In that shift, the mental health aspect of those relationships is of increasing concern to school authorities, she said in summarizing the report of the American School Health Association's Committee on Mental Health in the Classroom.

The report discussed some of the principles to be followed in setting up mental health training programs, indicated frequently encountered problems, and reviewed a number of programs employing different and difficult approaches. The report pointed out the following:

The purpose of inservice training in mental health is to help the teacher attain greater self-knowledge and more insight into the meaning of children's behavior. The beginning teacher may be bewildered to find that, despite excellent preservice training, he was prepared for ideal situations rather than overcrowded classrooms. It is precisely in the area of establishing satisfactory home, school, and public relations that preservice training is weakest. These combined problems may affect the beginning teacher's mental health.

The experienced teacher may be unaware of how much has recently been learned in the field of child behavior, growth, and development, and there is much he could learn in an inservice training program.

### *Teacher Objections*

However, teacher opposition may be encountered in setting up inservice training programs in mental health. Many teachers resent giving up their time. Others regard the programs as an implied criticism of professional ability. Some may resent any disturbance of their teaching patterns, while others have never worked successfully in groups and fear any group experience. All these attitudes are mental health problems. These teachers need help in improving their own human relationships before they can understand and help the children in their classrooms.

The objectives of training programs in mental health can best be achieved by arousing the teachers' enthusiasm which depends largely on the part the teacher has in planning the programs. The training should grow out of the felt needs of teachers, and the entire school staff should participate. Parent participation, to bridge the gap between home and school, is encouraged.

### *Superior Program*

Enrollment figures for education classes in mental health at the University of Michigan and Wayne University indicate the success of the Detroit school system in arousing teacher interest.

When the Detroit program was started in 1947, the two universities jointly offered a 16-week course which included half hour showings of films and transcripts, an hour's lecture by a psychiatrist, professional educator, or social worker, and an hour of discussion. By July 1952, the course had been given 15 times with an enrollment of 2,856. Advanced courses attracted an enrollment of 558. A total of 3,680 school staff members attended short courses of three meetings each.

The Detroit program featured the visits of a psychiatrist to classrooms one afternoon each week to discuss his observations with the teachers. Similar programs are being carried out in Los Angeles and Madison County, Ill., and by State education departments in Massachusetts, Oregon, and Pennsylvania.

School systems throughout the country are coming to realize that teachers should have the same skill in recognizing mental illness among children as they now show in detecting physical handicaps.

# Epidemiological Studies . . .

*What clues have been uncovered as to the causes of the recent outbreaks of infantile diarrhea? Investigators report their findings as well as observations on shigellosis, infectious hepatitis, and toxoplasmosis. In another report, healthy bats are suspected as rabies carriers.*

## Links Ohio Outbreak To Environment

A contaminated environment may have a major part in the spread of infantile diarrhea in a hospital nursery.

This was the conclusion reached during a 2-month outbreak of contagious diarrhea among young babies in Children's Hospital, Columbus, Ohio, late in 1953. As a result of this experience, measures to prevent the spread of this infection in the hospital have been modified and improved.

So stated Warren E. Wheeler, M.D., professor of pediatrics, Ohio State University, Frederick Wentworth, M.D., communicable disease division, Ohio Department of Health, Bertha Wainerman, M.D., and R. T. Ravenholt, M.D., of Columbus.

They reported that the source of the outbreak could not be determined, but that the increase in infantile diarrhea cases admitted to the hospital in the fall of 1953 apparently reflected the prevalence of infections with *Escherichia coli* O111 in the community.

Twenty-seven infants in two nurseries and nine adult contacts among the hospital personnel were involved in the outbreak. Five of the babies acquired their infection at home. Three of the hospital personnel were porters who cleaned the rooms but had no direct physical contact with the babies.

One nursery contained a diarrhea unit and a respiratory unit. The same treatment and utility rooms were used for both units, and the same resident physicians and nurses cared for the patients. The other nursery was used chiefly for surgical cases and had its own physicians and staff nurses, who cared only for the patients in this nursery. The nursing supervisor and some of the housekeeping personnel, however, served both nurseries.

### *Treatment and Prophylaxis*

Specific treatment with chloramphenicol, neomycin, or oxytetracycline was given, along with symptomatic treatment and water and electrolytic replacement therapy. Penicillin, sulfadiazine, or both, were given to most babies in an effort to prevent respiratory infections.

Prophylactic administration of chloramphenicol failed to prevent cross-infection—half of the babies developed resistance to the drug—but positive cultures declined sharply after beginning neomycin therapy. All babies who received chloramphenicol or neomycin also were given vitamin K.

Evaluation of environmental contamination was attempted during the latter part of the outbreak. However, at that time, the outbreak was almost under control, and, perhaps because of therapy, only a few organisms were found.

Wheeler and his co-workers pointed out that a nursery in a general children's hospital cannot be closed when a diarrhea epidemic occurs. If the disease is present in the community, the hospital must be prepared to receive infants who have the disease.

They recommended that at the beginning of an epidemic in a hospital ward, no babies under 6 months old be admitted until it is reasonably certain that the epidemic is under control. Babies under 2 months old are very susceptible to infection with *E. coli* O111, and the cross-infection rate is much higher in this age group than among older infants.

Wheeler and his colleagues also recommended that chloramphenicol not be used as a preventive agent because of the resistance to this drug developed by this strain of *E. coli*.

One of the measures taken by the hospital was to see that personnel acquiring the infection were treated with neomycin and excluded from work until a negative culture was obtained.

## Shigellosis Agent Shift Found in Two Epidemics

A dysentery epidemic may be viewed as a dynamic process in which different serologic types exhibit varying degrees of success in invading the host population, Lt. Col. Robert B. Lindberg, MSC, USA, and Kenzo Okabe, Ph.D., concluded after observing shigellosis outbreaks among prisoners of war in Korea and Japanese civilians in Tokyo from 1950 to 1953.

Colonel Lindberg is in the Department of Bacteriology, Army Medical Service Graduate School, Walter Reed Army Medical Center. Dr. Okabe is in the Department of Chemistry, Japan Armed Forces Medical Laboratory, Kurihama, Japan.

Shigellosis, they said, is a disease of classic importance in military medicine and among civilians displaced by war or natural disaster. But recently developed techniques for distinguishing *Shigella* strains by antigenic analysis, they continued, have not been widely used to study causative types in epidemics.

In both the Tokyo and Korean outbreaks of bacillary dysentery, the

predominant etiological agent, according to Lindberg and Okabe, was a *Shigella flexneri* type or group of types which was replaced by another *flexneri* strain during the 3-year period.

The situation in metropolitan Tokyo, where reported cases of bacillary dysentery rose from about 58,000 to over 100,000 per year between 1951 and 1953, was the simpler of the two, they said. One preponderant type, *Shigella flexneri* 2a, was slowly but consistently replaced by the closely related but biologically distinct type 2b. *Shigella sonnei* and several less frequently occurring *flexneri* types were constantly present but did not fluctuate markedly in incidence.

### *Situation Contrast*

The epidemic in Korean prisoner of war camps was much more severe than the outbreak in metropolitan Tokyo, Lindberg and Okabe reported, and since the camps had a confined, although shifting, population living under less than optimal conditions of sanitation, the circumstances were quite different. The carrier and contact rates, they continued, were undoubtedly greater in Korea. However, they found a comparable fluctuation pattern in type incidence.

Two types, *Shigella flexneri* 4 and 3, dominated the Korean epidemic at its start. But they diminished in consequence while types 2a and 5 rose steadily to comprise the major causative agents at the end of the outbreak.

### *Speculations*

There is no established reason, said Lindberg and Okabe, for the type shifts reported in these epidemics. Since it has been suggested that people might develop immunity through contact with the original causative agents, Lindberg and Okabe agreed that this factor might be significant for epidemics among a closed population. But they doubted that an immune group could be altered as rapidly as observed outbreak conditions in Japan would demand.

Another speculation, they said, concerns the role of bacteriophage in the destruction of predominant types. In this connection, it has been surmised that the alterations might represent abrupt genetic changes among the *Shigella* organisms. Lindberg and Okabe said they found no grounds for assuming the operation of such a mechanism in these epidemics.

They pointed out the necessity for continued observation of dysentery epidemics if the significant types are to be recognized. This recognition, they continued, is the essential basis for control of carriers.

## Reviews Toxoplasmosis, Urges More Study

The incidence of toxoplasmosis in different locales varies sufficiently to require examination of multiple serum samples from a patient suspected of having acquired the disease, noted Harry A. Feldman, M.D., in discussing various laboratory and epidemiological aspects.

Dr. Feldman is associate professor of medicine, State University of New York, Upstate Medical Center, Syracuse.

Many times a clinical syndrome has been related to infection by *Toxoplasma gondii* because antibody is detected in a single serum sample, he stated.

From studies of the "normal" populations of some 11 different areas of the world, he presented several examples to show why a single sample may not be sufficient.

A positive test may have considerably more significance in some areas than in others, he said.

Feldman used lantern slides to present his evidence on how and where man acquires this infection and made the following observations:

1. From information gathered from congenital cases, different seasons apparently do not carry significantly different degrees of risk for acquiring infection.

2. From tests of various animal serums for antibody content, dogs and cats appear to be possible reservoirs for the disease in humans.

3. There is no evidence as yet that the disease is transmitted from human to human. It has been found, however, that most husbands of mothers of congenitally infected infants have no serologic evidence of previous infection.

More studies of "normal" human and animal populations are needed to complete the information on the spread and acquisition of the disease, he pointed out.

### *Diagnostic Procedures*

Feldman discussed four procedures for diagnosing toxoplasmosis: isolation of the organism from tissues and cerebrospinal fluid, the dye test for serum antibodies, the complement fixation test, and the skin test.

Noting that the dye test is an extremely sensitive method of demonstrating antibodies for *Toxoplasma*, he outlined the procedure.

Dye test antibodies develop quickly, reaching high levels within about 2 weeks after onset of infection, and persist in a slowly diminishing titer for many years if not for the life of the individual, he remarked.

Since complement-fixing antibodies appear slowly and tend to disappear fairly rapidly, it is possible to encounter a highly positive dye test in the presence of a negative complement fixation test, he pointed out, recommending that if there is any question about the serologic data, a second serum be examined about 2 weeks after the first.

If the complement fixation test remains negative, the probability that there is an active infection can be discounted, he said.

In Feldman's opinion, the skin test is of no value in a specific diagnostic problem. If it has any usefulness at all, he said, it is as an epidemiological tool in surveys.

The newer serologic procedures,

he commented, have helped elucidate the spectrum of the clinical expression of infection with *Toxoplasma*. For example, it is known that congenital toxoplasmosis may be manifested by chorioretinitis, cerebral calcifications, disturbances in the head size, psychomotor retardation, and convulsions, he stated.

He said he found almost every surviving patient to have had chorioretinitis and about half to have had each of the various other evidences of damage.

## Seek Clues to Outbreak Of Infectious Hepatitis

An outbreak of infectious hepatitis in a suburb of Detroit, Mich., during the fall and winter of 1953–54 emphasizes the difficulties surrounding the epidemiology of this disease, maintained William R. Stinger, M.D., M.P.H., of the Wayne County Department of Health, Eloise, Mich.

These difficulties, Stinger said, are: (1) the existence of subclinical infections, (2) nonspecific laboratory tests, (3) varying clinical manifestations, (4) poor reporting, and (5) multiple transmission routes.

The outbreak also emphasized that good personal hygiene and the proper disposal of sewage are of utmost importance in the control of infectious hepatitis; that children are attacked more frequenly than adults; and that gamma globulin is an effective prophylactic agent when administered prior to the prodromal stage of the disease, Stinger declared.

Positive diagnosis of infectious hepatitis was established for 42 persons, not including any person without clinical or laboratory evidence of liver involvement. The outbreak attracted attention in January 1954 when a public school principal reported that several students and a teacher were absent from school because of jaundice, Stinger stated.

Investigation by the health department included, first, interviews with school authorities, patients, parents of patients, and attending physicians, and, second, interviews with all students and teachers who had been absent from school during October, November, or December and consultations with local physicians and clinic and hospital personnel, he said.

Of the 36 school children ill with infectious hepatitis, 32 attended the school from which the report came, Stinger said. Another patient was a teacher at this school, and 4 more patients were household contacts of one or more of the children at this school.

### *Survey of Sanitary Facilities*

Stinger reported that a survey of the sanitary facilities at the school where the initial cases occurred revealed several situations that suggested the possibility of backsiphonage of sewage into the school's water supply.

It cannot be proved, however, that any of the conditions were partially responsible for transmission of the disease in this outbreak, he stated

The survey also indicated that, although facilities for hand-washing were available, soap and towels were often lacking, he added.

Concerning sex and age distributions of the cases, Stinger reported that 26 of the patients were males and 16 were females and that 35 were in the age group 5 through 14 years.

He pointed out, however, that the age distribution may be partially due to more intense case finding in the school populations.

Interviews of household contacts of all patients about 3 months after the onset of the last reported case showed that only 1 case of infectious hepatitis occurred among the 67 contacts who received gamma globulin. This person, however, had received the globulin 4 days prior to the onset of the disease, Stinger noted. Four cases occurred among the 64 contacts who did not receive the globulin, he specified.

## Healthy Bats Suspected As Rabies Carriers

The Mexican free-tailed bat may be a carrier of the rabies virus, preliminary studies in Texas have revealed. This insectivorous species, *Tadarida mexicana*, is a member of the family Molossidae, whose habitat in this country is Texas and other westward States.

As a result of their studies, Lt. Col. Kenneth F. Burns, VC, USA, and Col. Charles J. Farinacci, MC, USA, of the Fourth Army Area Medical Laboratory, Fort Sam Houston, reported finding the inapparent infection of this species with the virus of rabies. This new observation, they said, has considerable epizootiological and epidemiological significance, suggesting the existence of "healthy carriers of this disease." Seven cases of human rabies were reported in Texas during 1952–53.

The feeding and breeding habits of *T. mexicana* permit chance rabies infection from the bites of a known carrier, the vampire bat *Desmodus*, they noted. Recent reports of bats attacking humans and the confirmation of rabies in insectivorous bats offer an additional explanation of how the disease may move from place to place in rapid succession, they explained. Attacks on one species by another have been witnessed. Infected vampire bats may therefore transmit rabies to insectivorous bats under natural conditions. Insectivorous bats, when rabid, may bite other mammals.

Burns and Farinacci speculated about the possibility that *T. mexicana*, even though apparently normal and healthy, may constitute a reservoir of rabies. This would lead to the perpetuation of the disease in wildlife and to the occasional infection of humans, they said. The higher the incidence of rabies in animals, the greater is the opportunity for human rabies, the officers said. They urged control measures aimed

at reducing possible reservoirs of rabies.

*The Bat Survey*

According to the researchers, a bat survey was begun early in 1954 at the Brooke Army Medical Center, Fort Sam Houston. Only the external characters of the bats collected were identified; all were classified as *T. mexicana*.

The first collection netted 32 apparently physically normal bats. At the time of the second collection, which yielded 35 bats, deranged behavior, muscular tremors, urine incontinence, and paretic manifestations were observed among the bat population. Scores of deaths were recorded. At first these symptoms were attributed to the effects of an intensified DDT program in the area.

While the DDT program was under way, five additional bats were brought in. One was found in a state of spastic paralysis, hanging from a screen door. Three others evidenced paralysis, and the fifth had symptoms of encephalitis. Other collections of apparently normal bats were later taken.

All collections produced 207 bat serums which were divided into pools and stored at a freezing temperature until tests could be performed. Neutralizing antibodies were observed in the serums from apparently normal healthy bats, indicating past experience with rabies. Statistical significance was attached by Burns and Farinacci to the high percentage of bat serums which were positive for neutralizing antibodies. Inactivation of the bat serums did not eliminate the rabies virus neutralizing substance in the blood.

Burns and Farinacci said, "The plausible explanation appears to be that this virus inactivator is specifically related to immunity."

Two isolates were obtained. Tests with infected mouse brain tissue against known rabies immune horse serum demonstrated that the immune serum neutralized both its homologous virus and the two newly isolated bat strains. Negri bodies had previously been observed in the brains of the bats from which the isolations were made.

"The high percentage of bat serums which contain neutralizing antibodies is probably a result of survival from rabies infection, possibly in inapparent form," Burns and Farinacci suggested. However, the presence of rabies virus in the brains of nonsanguivorous bats does not necessarily establish that they are

## William Thurber Fales

Dr. William Thurber Fales' concept of the service a vital statistician can give to the community in which he lives and works may prove to be his greatest contribution to his chosen field of demography.

Dr. Fales, whose home base from 1934–53 was the statistics section of the Baltimore Health Department, saw very clearly the value of the registrar function to the individual citizen, the clinician, the epidemiologist, and the health administrator.

But he also had the idea that vital statistics were "vital" and were related to such varied social programs as education, traffic provisions, housing, policing, and recreation.

It was this concept that led him to obtain population tabulations for the city of Baltimore on the basis of enumeration districts and to work with the Bureau of the Census in 1940 in developing enumeration districts that could most easily be correlated with the subareas a city uses for administrative purposes—school, police, voting, and health districts.

It took Fales some time to get this material into shape and to correlate it in a working fashion with the flow of births and deaths—his primary task. When he once had this information, he was the demographer for the city by the sheer force of the fact that he knew more about the population of Baltimore than anyone else—and he gave what he knew in order that the data might obtain their greatest usefulness.

Many times, reports and activities completely changed form and direction after city officials had consulted Fales.

Fales engaged in national and international activities—such as the National Health Inventory, the President's Commission on the Health Needs of the Nation, and the International List of Diseases and Causes of Death—as well as city and State. But he always kept clearly in mind the fact that the force of his contributions to social problems came from his knowledge of vital statistics and from his ability to apply this knowledge to the problems at hand.

I feel sure that any trained vital statistician who can get Fales' concept of the power that comes from knowing more about the population and its flow of births, deaths, and migration than anyone else in the area can carve out for himself a career as interesting and valuable as Fales'.

—Lowell J. Reed, *President, Johns Hopkins University*

capable of transmitting the disease, even though unprovoked attacks on humans by certain of these species are known to occur, they remarked.

## Oral Penicillin Effective In Navy Outbreaks

Oral penicillin offers a safe, practical, and inexpensive way to control epidemics of streptococcal infections, according to Comdr. John R. Seal, M.D., head, Communicable Disease Branch, Preventive Medicine Division, Navy Department.

Penicillin prophylaxis is not considered a desirable or final answer to the problem of controlling epidemic streptococcal infection, he declared. Rather, it is an interim measure to allow emergency control, he said.

Epidemics of streptococcal infections and rheumatic fever can be abruptly terminated through the use of 500,000 units of oral penicillin daily, he said.

If continued for 10 days or longer, this dosage will eliminate streptococci from most infected persons and provide more or less prolonged residual suppression of an epidemic, he said.

Reactions to oral penicillin are negligible, and strains of streptococci resistant to this antibiotic have not been found, he asserted.

### *Objectives and Results*

Studies were started in 1951 to find the smallest dose of oral penicillin which would effectively suppress streptococcal epidemics and to learn the smallest practical dose for prophylaxis, Seal related.

Doses from 50,000 to 500,000 units daily were used for suppression of epidemics, he said. All doses employed seemed to have some efficacy in converting throat cultures from positive to negative, he remarked, but it was not until a dose of 375,000 units daily was reached, that a marked decline in carriers resulted.

The most dramatic effect was obtained from a dosage of 500,000 units of penicillin daily, he said.

Treatment was begun on a Saturday night. On Sunday, 2 patients with scarlet fever and 1 with clinical evidence of other streptococcal infection were found. Thereafter, during 2 weeks of prophylaxis, he reported, no further patients with streptococcal infection were found.

No rheumatic fever occurred in one regiment in an 18-week period following the end of a course of prophylaxis with 500,000 units of oral penicillin after 12 cases had been admitted in the 7 prior weeks, he reported.

Results with a single daily dose of 50,000 units in two other regiments differed considerably from those obtained with 500,000 units, he commented.

Admissions for streptococcal infections were markedly reduced, but not terminated, and the relative prevalence of specific types of streptococci was not altered, he said.

Carrier rates and the frequency of rheumatic fever seemed to be reduced, he added.

### *Reactions, Costs*

With few exceptions reactions to oral penicillin were a mild, transient urticaria, he said.

Of 39,615 recruits treated with penicillin, 134, or 0.34 percent, reacted, he reported.

The average cost of 250,000 units of oral penicillin twice daily is about 3.3 cents per day per man in military populations, he reported.

The 50,000 unit dose costs less than one-half cent per man per day, he added.

# Care of the Chronically Ill . . .

*Progress in the control of chronic disease is reported and suggestions are made for greater progress in the future. Referral systems, rehabilitation of "poorhouse" inmates, conservation of hospital services, epidemiological and statistical studies, and new laboratory tests to diagnose the chronic diseases will help to develop procedures for the care of the chronically ill and for the restoration of many of them to useful life in the community.*

## Facilities Planning Accents Chronic Disease Problems

The new medical facilities survey and construction program offers States and communities the opportunity of crystallizing their thinking on the whole chronic disease problem, according to Surgeon General Leonard A. Scheele.

Under the new act, fiscal year 1955 appropriations amount to $2 million for use of States in conducting surveys to determine their needs for chronic disease facilities, diagnostic treatment centers, nursing homes, and rehabilitation facilities. A $21 million construction appropriation has been made available until the end of fiscal year 1956.

Although the current level of appropriations will not add more than a drop to the almost empty bucket of facilities, the Surgeon General said, the initial projects can be courageous experiments—beacons in each State and throughout the country.

Or they can be "just more space-fillers," capable only of perpetuating many past errors in dealing with long-term illness.

The Surgeon General stressed the need for finding better ways of financing long-term care and for the adoption of new concepts about chronic illness.

### *Financing Rugged*

Voluntary health insurance has made an excellent start, but current insurance benefits tend to pick up only the small end of the check, he said, adding that the resources of the patients and their families, as well as of public and private welfare agencies, public medical and hospital programs, and philanthropic institutions are severely taxed to carry the residual burden of long-term illness.

He expressed the hope that voluntary health insurance agencies, along with other private and public organizations, will develop and test in communities new plans for a more equitable distribution of the medical and hospital expenditures for long-term illness.

### *New Concepts*

Concepts generally held for the past half-century tend to equate long-term illness with incurable diseases that follow a rigid pattern of degeneration and death or with invalidism as an inevitable event in old age, he said. Regrettably, he added, these concepts also foster the assumption by society that the only solution is to provide enough institutions in which to store the unwanted victims of long-term illness.

We are learning, he said, that prolonged disability can be transformed into prolonged ability to work and live like healthy folk, or at least to take care of one's daily needs with little or no help.

The Surgeon General called for the acceptance of the concept that most of the patient's care can be provided in facilities within his own community. "Until we get that new concept firmly fixed in our thinking," he said, "we will go on emphasizing first the large and costly outside institution, and only last—perhaps too late—will we turn to the community general hospital and its outpatient department, the community health department, the local physician's office, and the patient's own home as appropriate settings for his continuing care."

Citing the community need for more different kinds of services than are commonly available today, he pointed out that only a few large cities have developed to a reasonably high degree home care programs which include medical, nursing, social, and housekeeper services, and physical therapy; ambulatory services offering diagnosis, therapy, and followup; and comprehensive rehabilitation services.

He discussed, as other important parts of the chronic disease picture, research and experimentation in care, combined planning by all the groups involved, and scrutiny by each organization of its own policies and operations in the whole area of long-term illness.

### *Study and Research*

The Surgeon General gave as an example of the studies and demonstrations needed in the whole field of long-term illness the projects of pioneering mental institutions. Some mental institutions, he said, "have made additions to their professional staffs for intensive treatment of selected patients who have been returned to their communities under hospital supervision. Others have set up outpatient departments, thus shortening the stay of many patients and avoiding many readmissions. Some are experimenting with foster home care; others with arrangements for allowing rehabilitated, but homeless, mental defectives to work in the community and return to the institutions at night."

In line with integrated effort, the Surgeon General reported that an Inter-Bureau Committee on Chronic Illness has been set up within the Public Health Service's Bureau of State Services and includes representation from the Office of the Surgeon General, the Bureau of Medical Services, and the National Institutes of Health. The committee has a charter, he said, to explore and report on all Public Health Service activities in the chronic illness field—research, medical and hospital services, facilities, and public health programs.

## Maryland Referral System Set Up for Chronically Ill

A referral system that will help each chronically ill patient find and use the most appropriate community service and thus use the chronic disease hospital only when he belongs there was advocated by V. L. Ellicott, M.D., Dr.P.H., acting director, chronic illness program, Maryland State Department of Health.

Many chronic disease hospital beds are filled by custodial patients whose conditions cannot be improved. Such usage interferes with the hospital's primary function as a dynamic treatment center, Ellicott declared.

In the absence of adequate referrals, he said, the new patient who should go to a nursing home is too frequently allowed to go to the chronic disease hospital simply because the path to the hospital is established while the path to the nursing home is not. The patient who is due for a transfer from the hospital to a nursing home will stay in the hospital if no one is made responsible for finding a bed in a nursing home or because a technicality prevents a welfare board from certifying his financial status, he added.

Integration of the services of the chronic disease hospitals, the other hospitals, nursing homes, welfare boards, local health units—which provide health services to patients at home—and various other participants, Ellicott said, requires agree-

ment on the following basic concepts:

1. The patient must be able to reach any service he needs, whether it be rehabilitation or custodial care, and whether the patient is indigent or not.

2. Provision must be made for social service guidance and for smooth and prompt transfer of the patient from one service to another.

3. A competent agency or group must assume responsibility for solving any problem which may keep the patient from receiving service.

Maryland, Ellicott reported, has recently set up machinery for correlating its two State-operated chronic disease hospitals with other services. Both the hospitals and the integration program are operated by the State health department, he noted.

It will be the job of those directing the chronic illness program, Ellicott observed, to get cooperation: to increase understanding of the types of services available and the channels for referrals; to supply current lists of vacant nursing home beds to chronic disease and general hospitals; and to set up a consultation service for families and professional workers who need help in selecting the most appropriate facilities for various types of patients.

## Allegheny County Restores "End of Line" Inmates

The hapless, hopeless, helpless "poorhouse" occupant can be transformed into a cheerful, conversant, and animated individual, the Allegheny County Institution District in Pennsylvania has found in its 8 years of experience with a physical restoration program at its Woodville and Mayview facilities for the indigent ill.

Too many county institutions practice debilitation rather than rehabilitation, declared Murray B. Ferderber, M.D., assistant professor of medicine, University of Pittsburgh School of Medicine and consultant in physical medicine and rehabilitation to Allegheny County.

In 1946, he said, few medical personnel — institutional or private — felt that the county home candidate offered any chance for physical redemption. This "end of the line" concept did not reckon with the physical and emotional resurgence possible for even the aged under a regimen of good medical care, social services, and physical therapy, Ferderber indicated.

In calling for a revised attitude toward county institutions, Ferderber pointed out the reasons that may make admission to a public facility necessary. The course of productive convalescence may be too long and costly for private care; home care may take a wage earner out of circulation; the family may be unable to continue with the prescription; and the health of other family members might be impaired, he said.

### *Then and Now*

Formerly upon admission to Allegheny County facilities, Ferderber related, the patient was "parked," given a routine examination, and the cursory "poorhouse" care, and left to exist socially as best he could.

Today, upon admission the physician follows the accepted routines of good medical care, basing his diagnosis on history, physical examination, and laboratory data, he said. The physician sets down definitive orders for the particular disability and pathology. The social service department integrates its information simultaneously.

The "team"—the physician, nurse, therapist, social worker, physiatrist, and the orderly-attendant—meet at the patient's bedside to discuss the problems. The bedside meeting, Ferderber said, immediately dispels the patient's primary fear of neglect and constitutes the first step toward physical self-sufficiency.

The therapist and aide combine efforts on indicated bed exercises and simple techniques that will prevent the deformity, bed sores, and other unnecessary results of excessive bed and chair fastness, he reported.

The next stop, when the patient can be transported by wheelchair, he said, is the simply equipped therapeutic gynmasium for physical rehabilitation. The disabled engage in exercises commensurate with their ability, and in the course of this group participation the vacuous, stolid expressions of institutional apathy disappear, he said.

At least once monthly the rehabilitation board, composed of the staff physician in charge, social worker, rehabilitation technician, aide, and physiatrist, meets to discuss the needs and disposition of the patients.

### *New Quarters*

Physical restoration will be enhanced in a new county institution now under construction near Pittsburgh and expected to open in late 1956, Ferderber said. The institution will house about 2,200 patients and provide a well-equipped hospital for the needy ill with the exception of a surgical pavilion.

The institution district expects to follow its present procedure of calling in consultants and, when needed, of transferring the patient to the consultant's hospital for surgery, he said. The new building will provide simple egress for at least 1,100 ambulatory patients to park areas without the need for using steps and elevators. An auditorium built in four tiers will eliminate the use of elevators, ramps, and steps, and provide the patients with entertainment and recreation, he concluded.

## Advocates Conservation Of Hospital Services

General hospitals will serve most effectively as powerhouses, not storehouses, in the treatment of prolonged illness, C. Rufus Rorem, Ph.D., execu-

tive director of the Hospital Council of Philadelphia, stated.

For some prolonged illnesses, he said, the hospital has served mainly as a dormitory with only occasional interludes requiring professional health services. He advocated conserving the use of hospital personnel, equipment, and buildings for professional health services.

Rorem offered several other points for the comment, criticism, and action of professional and community groups in organizing health services for chronic illness.

Home care for chronic illness will achieve its destiny only when it is regarded as a professionally desirable procedure, not merely a "poor relation" of hospital inpatient service, he predicted. Most home care experiments administered by hospitals have developed from overcrowded conditions in their wards, Rorem pointed out. He commented on the importance of recognizing that a person may be a "hospital patient" while receiving supervised care in his home.

Experimentation in improved care of prolonged illness need not wait upon new construction of facilities, Rorem observed.

He pointed out, "If home care administered by visiting nurse societies can avoid the need for additional hospital beds, such ventures should be encouraged. If circuit rider medical services to homes for the aged can serve the health needs of most of the residents, the individuals, the hospitals, and the community will gain by the procedure. If existing homes for the aged and infirm can extend their recreational and personal services to elderly individuals living at home, they may reduce some of the illnesses attendant upon lonesomeness and boredom."

Rorem also predicted that outpatient services for long-term illness will become increasingly important at hospitals, particularly for specialized procedures. They will conserve the professional energies of the attending physician.

The problem for individuals, professional groups, institutions, and the general public is to develop health services in accord with changing patterns of homelife and community organization, Rorem said. One thing seems clear, he concluded, there will need to be some changes made in the organization of health service, as well as in the sources and methods of financial support.

## Uses of Epidemiology In Chronic Disease

Many epidemiological studies are "case series in search of a universe," said Philip E. Sartwell, M.D., M.P.H., professor of epidemiology, Johns Hopkins University, School of Hygiene and Public Health, in his discussion of the various approaches to the epidemiology of chronic disease.

Information is readily available on the characteristics of patients with a given illness, he said, but if the relationship of these characteristics to the disease is to be learned, their frequency in the population must be established. That is, a series of clinical histories must be related to the universe out of which they arose.

This, said Sartwell, is the task of the epidemiologist, and success may provide a clue to an unrecognized cause of the disease or even lead to a well-supported etiological hypothesis.

### *Source of Data*

Pointing to the Federal census as the most obvious source of "denominator" information, Sartwell said, however, that knowledge of many chronic diseases already includes a rough idea of their distribution in reference to the data furnished by the census on age, sex, race, geographic distribution, and some other characteristics. Needed, he said, is an investigation of factors which are not as well known.

One approach to gathering these factors, he continued, is the type of community survey which after repeated house-to-house canvassing of all the families in 24 villages helped to identify the cause of pellagra in 1921. The objectives of the method are, at the same time, to find cases of a disease and to obtain denominator information on the population in which the cases appeared. Mass screening surveys are capable of furnishing similar information when appropriate information is secured on the population examined. Sartwell characterized this approach as too expensive and difficult to be used for rare illnesses or in any situation in which there is not already a hypothesis to be confirmed.

Refinement of the denominator data is possible when the population under study constitutes a defined group from whom specific information is routinely secured, such as employees of an industry or life insurance policyholders. Rates of prevalence, incidence, or mortality may be obtained which are specific for such factors as, for instance, occupation.

### *Random Sample*

Instead of trying to learn the characteristics of the entire population, an alternative approach is to draw a random sample of the population, matched for age, sex, and race with the series of cases. Much more detailed information can be secured from such a control group than would be possible from the whole population. The frequency of the attribute in which we are interested can then be studied in the controls as compared with the cases. Sometimes, when the cases are a series of hospitalized patients, persons hospitalized with other diseases may serve as controls, although they are less satisfactory in some ways.

If an association is found by any of these methods between an environmental factor and the occurrence of a disease, it must be rechecked through repeated studies by independent methods. This may lead to the development of a more specific and useful hypothesis, the rejection of the whole idea, or to a completely

new avenue of inquiry. The long final step, from association to causation, is taken only after assembling information from all sources, demonstrating its consistency, excluding the possibility of indirect association, and if possible supporting the hypothesis with experimental laboratory evidence.

## Urges Laboratories Develop Chronic Disease Tests

Just as in the past the public health laboratory has served the physician in his diagnosis and treatment of infectious diseases, it can serve him in the future in the control of chronic diseases, asserted Seward E. Miller, M.D., chief, Division of Special Health Services, Public Health Service.

The public health laboratory has an actual responsibility to help solve the main health problems of the day, he declared. Today, there is need and opportunity for further development of diagnostic tests, both general and specific, for the more than 50 chronic diseases to which our older population is susceptible, he said.

Of the three main services performed, research, diagnosis, and teaching and training, the major contribution of the public health laboratory is the development and application of diagnostic procedures, Miller commented. Equally important, he added, is the training of personnel in some of the newer diagnostic techniques as they are developed.

### *Clinical Diagnoses*

Clinical diagnosis by laboratory examination has become an indispensable aid in medicine and surgery, he asserted. Present knowledge of the major chronic diseases, however, he pointed out, varies widely in the availability of diagnostic procedures.

Miller then reviewed the diagnostic status of arthritis, cancer, diabetes, and heart disease and discussed multiple screening and its relationship to clinical diagnosis.

Among the procedures needed, he said, is a test for rheumatoid arthritis. The National Institute of Arthritis and Metabolic Diseases, he reported, is now working on a serologic test which it is hoped will be as specific as the syphilis and diabetes diagnostic tests.

Another urgent need, Miller said, is a general test for the detection of cancer. The ideal test, he commented, would be applicable to most anatomic sites of the body, and could be easily and economically given to a large number of persons.

Not all of the responsibilities of the public health laboratory are associated with disease entities, Miller said in pointing out that there is a tremendous challenge in the problem of guidance for antibiotic therapy resulting from the introduction of antimicrobial agents.

Guidance, he maintained, should be the key word in the relationship with privately owned laboratories. The public health laboratory should not compete, but lead the way, training personnel and providing standardized solutions or reagents. Closer collaboration could facilitate solution of some of the diagnostic and therapeutic problems in chronic disease.

## Insurance Study Affords Long View of Diseases

The value of a 1951 medical impairment study as a unique source of new data on the long-term effects of diseases and physical conditions was underscored by Edward A. Lew, actuary and statistician, and Herbert H. Marks, manager, medical statistics, of the Metropolitan Life Insurance Company.

This study, made under the auspices of the Society of Actuaries, included the experience of 27 large life insurance companies on 625,000 persons with specific medical impairments to whom policies were issued at standard and substandard rates between 1935 and 1949 and who were traced to the policy anniversary in 1950.

Some 132 groups of impairments are included in the study. The average period of observation was slightly more than 6 years. The study results are presented in the form of ratios of actual deaths to the number of expected deaths if the mortality had been the same as that experienced by persons insured under standard ordinary policies during the same period.

Terming the study a "classical example of long-range followup studies," Lew and Marks enumerated the characteristics of the data:

1. The study group, drawn chiefly from white male adults in the middle to higher income brackets, represents a highly selected sample of the population. Their selection for ordinary life insurance presumes a good state of health.

2. Virtually all of the persons were medically examined. Frequently, supplementary information was obtained from the individual's physician.

3. The results of the medical examinations have been generally reported in terms of specific findings, not in diagnostic terms. Example: constant systolic murmur at the apex, *not* rheumatic heart disease.

4. The data represent the results of average medical care rather than care by selected specialists or clinical groups.

5. The survivorship record of the individuals included can be accurately evaluated by reference to the contemporaneous experience among all persons to whom life insurance was issued at standard premium rates during the period of the study.

6. The findings can be compared with information contained in earlier impairment studies of the kind.

### *Some New Facts*

The conclusions can be useful to public health workers in evaluating

programs, estimating future caseloads, and in keeping the public informed about the outlook for persons with various medical impairments, Lew and Marks said. Such statistical studies may be expected to shed light on the natural history of chronic diseases, they added.

Selected findings which bear on traditional public health problems were reported. Among them, briefly stated here, were these:

*Pulmonary tuberculosis.* Underweights experienced mortality no higher, and in some instances, lower than persons of average or above average weight. The extra risk of death from the degenerative diseases of later life associated with even a slight degree of overweight currently overshadows the extra risk of death from tuberculosis and other respiratory diseases in the long-range picture. The need for continuous medical supervision of persons with a history of active tuberculosis is indicated by the excess mortality from the disease in this experience.

*Coresidence with tuberculosis.* Contacts are subject to an appreciable extra risk of acquiring the disease and might, therefore, benefit from periodic medical checkups.

*Rheumatic fever.* Relatively high mortality among the cases under 30 at time of policy issue points up the sizable risk of its recurrence, even though a considerable time may have elapsed since the last attack and no evidence of heart damage is found on examination. Mortality was even higher among cases with a history of rheumatic and streptococcal infection who were found to have a systolic murmur over the apex of the heart and especially so when the heart was enlarged.

*Diseases of the cardiovascular system.* Among persons with two or more close relatives under age 60 with heart or related disorders, the death rate was significantly higher than normal, primarily because they, too, experienced excess mortality from these cardiovascular conditions.

*Poliomyelitis.* For those issued standard insurance, despite the crippling effect of the disease, the mortality was about the same as for standard life insurance risks. Among the cases with more serious degrees of crippling, who were limited to substandard insurance, the mortality was about one and one-half times the expected.

*Syphilis.* The results in the carefully selected cases accepted for life insurance indicated that adequate treatment of syphilis by earlier methods (heavy metals) was apparently successful for many.

*Maternal hygiene.* Women who have had a child delivered by cesarean section run an extra risk in subsequent pregnancies, but the operation itself has no adverse effects on the longevity of the mother.

*Mental disorders.* Suicide accounted for a major portion of the excess mortality among persons with a history of neurasthenia, psychoneurosis, or of psychosis. An above-normal suicide rate was recorded also in those who reported a history of insanity in two or more close relatives under age 60.

# Insecticides and Pesticides . . .

*The subject of DDT toxicity and the potential hazards involved in the use of the cholinesterase-inhibitor group are reviewed. The role of pesticides in agriculture and the Federal regulations for testing and controlling pesticides prior to marketing also are discussed.*

## Cholinesterase-Inhibitor Group Reviewed

A great deal of confusion and lack of understanding exist concerning the potential hazards of organic phosphates of the cholinesterase-inhibitor group such as parathion, malathion, Diazinon, Shradan, and Systox, when they are used as pesticides, declared L. W. Hazleton, Ph.D., president, Hazleton Laboratories, Falls Church, Va., in spite of the fact that rarely has so much been known about a class of chemicals and its individual members before they are put to constructive use.

Some of these materials are relatively nontoxic; others are acutely hazardous, Hazleton said. All are toxic following oral administration, dermal application, or inhalation of particulate matter.

The danger to the user or to the general public is no greater than the hazards from other commonly used industrial and agricultural chemicals, Hazleton stated. Danger is practically nonexistent, he said, because of the nonresidual nature of the chemicals, the intensive research made by industry, and the vigilance of the authorities regulating their manufacture and use.

Both Federal and State authorities require manufacturers to make extensive toxicological studies on each pesticide before it can be put on the market, he said.

### *Hazards to Workers*

Persons engaged in the manufacture and formulation of organic phosphate pesticides and those who handle them in concentrated form are in danger of toxicity and should be protected from exposure, Hazle-

ton warned. However, industrial hygiene techniques have practically eliminated hazards under these conditions, he said.

Individuals continuously exposed to these chemicals should have periodic checks on cholinesterase activity; those who complain of symptoms which might be associated with exposure to pesticides should be referred to a physician who is familiar with pesticide poisoning.

Although information regarding safe handling of the cholinesterase-inhibiting pesticides is available, occasional accidents occur because of failure to follow directions and carelessness in handling the material. Fortunately, recovery from both acute and subacute toxicity is complete, with no residual storage or pathology.

## Pesticides Must Be Tested Before Approval for Use

Pesticides can no longer be placed on the market without first being thoroughly tested, reported Justus C. Ward, M.S., in charge of the Pharmacological and Rodenticide Unit, Agricultural Research Service, United States Department of Agriculture.

### *The Insecticide Acts*

The Insecticide Act of 1910, which until 1947 was the principal Federal statute dealing with pesticides, related only to performance and purity, Ward continued. However, it became apparent that certain classes of pesticides which were not included in the 1910 law also needed control, and that many other features of poison handling were highly important, he said. This was particularly true, he said, from 1935 on, when new and spectacular insect, weed, and rodent killers presented problems for which there were no answers.

In June 1947, Ward said, the Federal Insecticide, Fungicide, and Rodenticide Act became law, and indiscriminate introduction of new and strange poisons into interstate commerce was immediately halted. This law required registration and clear labeling of poisons so that the user would know upon reading the danger involved in handling them, would know how to avoid injury, and, also, would know how to use the material to avoid destroying beneficial forms of life.

In addition, the law allowed controls over dosages of the pesticide that "would guarantee that the residues left on food crops would be within acceptable limits."

The 1947 act authorizes the Department of Agriculture, which is responsible for enforcement of the law, to consult on hazard problems of new poisons with the Public Health Service and evaluation of food residues with the Food and Drug Administration.

### *Extent of Testing Varies*

There are many complex tests to be performed before a research chemical becomes a pesticide, Ward stated. When a use for a chemical has been discovered, the commercial agency which will exploit it must make a minimum toxicological evaluation to determine its acute oral toxicity, its skin absorbability, and its inhalation hazard.

The use for which the chemical is intended will then determine whether further study is needed, and how much. For example, if a chemical to be used in agriculture presents no unusual hazards to the person using it and the precautionary labeling has been approved by the Public Health Service, it could be approved for use as an insecticide on nonfood crops. Long-term pharmacological data and adequate chemical residue analysis would be necessary before it could be used on food crops.

### *Household Pesticides*

Household pesticides which require protective clothing and special equipment should be used only by professional pest control specialists, the speaker said. Sprays for use in the home require the collection of extensive data on oral toxicity, skin absorption, and inhalation hazard. If the product is to be used in any way so that it will touch the skin, studies on skin irritation or sensitization must be done. If it is to be used as an aerosol or hand spray, repeated inhalation tests are necessary.

### *Protection Increasing*

The law also permits the Secretary of Agriculture to cancel full registration. This action must be followed immediately, however, by the issuance of a registration under protest. This is accomplished by a letter to the manufacturer detailing why the action was taken. Such a procedure, Ward stated, permits prompt action in notifying a manufacturer that unfavorable use experience has indicated need for curtailing distribution of his product.

A great deal of progress has been made in the control of poisons since the act of 1947 was passed, the speaker concluded, and as the laws are amended controls become more precise. "The public is demanding increasing protection against insidious chemical agents, whether they may be smog, car gas, industrial fumes, strong drugs, household chemicals, intentional food additives, or pesticides," Ward stated.

## Toxicologist Reviews DDT Intoxication

DDT is a safe material for men to use, Wayland J. Hayes, M.D., Ph.D., chief, Toxicology Section, Technology Branch, Communicable Disease Center, Public Health Service, Savannah, Ga., reported in reviewing present knowledge about DDT intoxication.

Abundant evidence is now available about human exposure to DDT, and such quantitative information should help satisfy any reasonable doubts about the safety of this chlor-

inated hydrocarbon insecticide, he said. Cautioning against alarm because of the need for additional research, he stated that human beings can withstand much greater exposure and storage of DDT than are now prevalent.

### *Today's Knowledge*

"The greatest recent advances in our knowledge of DDT are those which define the current exposure and the magnitude of tolerable dosages involving this compound," Hayes stated.

Because a greater tonnage of DDT is produced than any other insecticide—because it occurs as residues in food—and because it is stored in human tissue, interest in the material, already the subject of advanced chemical analysis, continues, he commented. Much remains to be learned about its toxicology and pharmacology, and about its basic mode of action.

Careful studies with extensive occupational exposure are proving the safety of the material, he added, in calling attention to these observations: In spite of the tremendous tonnage of the compound being used, the total number of reported cases of dermatitis from DDT is very small; the number of accidents has been very small; there is no well-described case of fatal, uncomplicated DDT poisoning; except in severe cases, recovery from mild poisoning has always been well advanced or complete in 24 hours; no instance of chronic DDT poisoning in man has been confirmed; and dermal exposure under conditions of actual use has not been sufficient to produce systemic poisoning.

More occupational disease has been caused by the solvents in DDT formulations than by the compound itself, Hayes pointed out. A number of deaths have been reported following the ingestion of DDT solutions, which are obviously dangerous to drink. Experiments with animals have revealed that digestible animal and vegetable oils enhance the toxicity of large doses of DDT. Kerosene, the most common solvent for this compound, has a considerable toxicity for man, a fact not fully appreciated.

The suggestion that DDT is the direct cause of a viruslike disease and of a psychoneurotic syndrome, as well as a contributing cause of poliomyelitis, hepatitis, cardiovascular disease, cancer, and a formidable array of animal diseases, finds no support in animal experiments or in human morbidity or mortality statistics, he remarked.

### *Our Daily Diet*

Fatty foods, or foods cooked in fat, tend to contain more DDT than other foods, but there is no indication that the amount of DDT occurring in our diet or stored in our fat is injurious, Hayes assured. Three well-balanced meals a day yield the equivalent of a dosage of 0.0026 milligram per kilogram per day, which may be compared with that of 0.5 mg./kg./day being taken currently without injury by volunteers, he said.

Hayes reported other findings relating to the effect of DDT on man. Some of these are summarized below:

Oral dosages of 285 mg./kg. have been taken without fatal result. But these and even smaller dosages lead to prompt vomiting so that the amount actually retained cannot be accurately determined.

Still unknown is the least dosage which, when repeated daily, will lead to illness.

No quantitative estimate can be given of the dermal toxicity of DDT to man. Many investigators have found it impossible to determine the medial dermal lethal dose ($LD_{50}$) of DDT because the material was simply not toxic enough. All agree the dermal $LD_{50}$ of undissolved DDT is extremely high—400,000 mg./kg., or greater.

DDT is broken down by the body. Two of the products, both formed by man, have been identified: DDA, the acetic acid derivative of DDT, is excreted in the urine; and DDE, the dehydrochlorinated derivative, is stored in the fat. Since it is indicated that significant dosage levels of DDT can be quantitatively related to the excretion of DDA in the urine, it should now be possible to measure objectively the exposure of workers, some of whom have been constantly engaged in the manufacture of DDT ever since its introduction to general use in this country in 1946.

## Pesticides Save Lives, Aid in Food Production

Without pesticides, the quantity and quality of our food, feed, and fiber would be drastically lowered, according to H. L. Haller, Ph.D., assistant director of Crops Research, Agricultural Research Service, United States Department of Agriculture. The use of pesticides to control insects saves millions of lives and reduces sickness and misery, he maintained.

Since the introduction of new pesticides, average per acre production of many crops has increased, in some cases by as much as 60 to 70 percent, he reported. Although not entirely due to their use, evidence shows that pesticides are a major factor in increasing the production of onions, potatoes, lima beans, and tomatoes, he commented.

Haller reported that with one-third fewer workers and about the same total cropland as in 1919, agriculture is now supplying a population 53 percent larger and producing better quality foods. However, he asserted, this effectiveness is only comparative and our margin of safety is thin. He pointed out that the losses still caused by crop and animal diseases, by parasites, insects, and weeds have been conservatively estimated at about $9.5 billion a year in a recent survey.

### *Food and Health*

Emphasizing that good public health is directly related to good

nutrition and not merely the prevention of infection, Haller went on to show that high-quality diets depend on scientific attacks against the fungi, bacteria, viruses, and nematodes which interfere with the productivity and quality of grain, fruits, timber, fiber and other crops.

In the war against weeds, he said that scientists are always aware that an average ragweed plant takes three times as much water from the soil as corn, that mesquite has made worthless 60 million acres of grazing land, that halogeton kills sheep, and that Canada thistle, Johnson grass, field bindweed and others choke and ruin crops. The insect enemies, which destroy crops and contribute to soil erosion as well as transmit diseases to man, he said, add up to an army of more than 700.

"The situation remains nip and tuck," he warned. "Competent agricultural scientists have pointed out time and time again that even a statistically small letup in the fight could very well set back our agriculture by many years."

### *Current Research*

Considerable research is needed, he said, to find effective controls for organisms that infest the soil. Tests with some of the new organic compounds have reduced infestations and brought striking increases in crop yields, he reported.

He cited the need for improved grasslands and for development of new herbicides, botanical pesticides, and antibiotics to control bacterial diseases of plants. All effects of chemical agents on quality of produce must be studied thoroughly before widespread use.

The control of insect vectors of diseases has been greatly aided by insecticides, but new compounds are needed because of the resistance to DDT developed by insects, Haller stated. As many as 2,000 new pesticidal compounds are formulated and evaluated every year, he said.

# Nutrition for School Children . . .

*When children in Iowa are not getting enough milk, fruits, and vegetables, as reported in one study, or when only 35 percent of all school children in the country have good diets, as reported in another study, perhaps more emphasis is needed on surveys of opportunities for education in good nutrition.*

## Children's Nutritional Status Studied in Nashville

Only minimal symptoms of possible nutritional deficiency were found in a 3-year study of the food intakes and nutritional status of Negro children in Nashville and Davidson County, Tenn.

A preliminary report on the study was made by Norma P. Dillard, M.A., nutrition analyst, and Verz Goddard, Ph.D., both of the Human Nutrition Branch, U. S. Department of Agriculture, Erna B. Jones, M.S., head, department of home management at Tennessee Agricultural and Industrial State University, and Natalie M. Tanner, M.D., of Detroit.

The project, completed in 1952, reported findings for 132 children, 66 pairs of siblings, chosen from families of comparable socioeconomic status. They were selected, said Dillard and her associates, so that each school child had at home a preschool sibling of the same sex and not more than 2½ years younger. Observations were repeated periodically on each child until the preschool sibling had completed at least one school grade. Of the 66 pairs who began, 54 completed the study.

### *Sibling Comparison*

Although the minimum deficiency symptoms were noted in about the same proportion of older and younger children, relatively few sibling pairs, said Dillard and her co-workers, showed the same symptoms at the same time, except in the case of long-bone deformities. They said that slightly more than 50 percent of the 56 children showing this condition were sibling pairs.

An apparent improvement in the physical condition of most of the children who received both examinations was indicated, according to Dillard and her colleagues, by a decrease in the observed number of clinical symptoms and by an increase in the number of children whose general appearance was considered good.

The dental caries rate of the children studied was high, but comparable to that reported in other studies on children of similar ages from areas where water supplies contained approximately the same amount of fluoride, 0.5 p.p.m. The average number of teeth that were decayed or filled increased from 2.9 to 5.4 for boys and from 4.3 to 6.0 for girls between the first and final examinations, Dillard and her associates reported.

### *Weight Range*

They said that over two-thirds of the weights recorded for all children were within the range set by the usually accepted standards for height and age. More weights below 10 percent of the standard were recorded than above the standard. However, since the deviation from

standard was greater for the overweight (the highest 44 percent above the standard as compared with a low of 25 percent for the underweight), the average weights fall very close to the standard.

Similarities in the findings for the sibling pairs were most obvious in the data resulting from the blood analyses made twice during the study, said Dillard and her co-workers. Blood serum levels of protein, ascorbic acid, and vitamin A were adequate for the majority of children, but the hemoglobin values were far below those reported by other investigators.

The minimal signs of nutritional deficiency most frequently observed were changes in the mouth, skin, skeletal structure, and teeth, according to Dillard and her colleagues. They said that many of the symptoms noted at the beginning of the study had apparently disappeared when the children were reexamined at its close.

**Number of calories per day needed by children, according to age [1]**

| Age (years) | Calories required (Girls and boys) | Age (years) | Calories required | |
|---|---|---|---|---|
| | | | Girls | Boys [2] |
| 10–12 months | 1,000 | 10 | 2,000 | 2,000 |
| 1 | 1,100 | 11 | 2,100 | 2,200 |
| 2 | 1,200 | 12 | 2,200 | 2,400 |
| 3 | 1,300 | 13 | 2,300 | 2,600 |
| 4 | 1,400 | 14 | 2,400 | 2,800 |
| 5 | 1,500 | 15 | 2,500 | 3,000 |
| 6 | 1,600 | 16 | 2,400 | 3,200 |
| 7 | 1,700 | 17 | 2,400 | 3,400 |
| 8 | 1,800 | 18 | 2,400 | 3,600 |
| 9 | 1,900 | 19 | 2,400 | 3,800 |

[1] Interpolated from Recommended Dietary Allowances, revised 1953.
[2] Double the age x 100.

## Classroom Good Place To Teach Nutrition

In serving lunches schools have an excellent opportunity to teach by example, as well as by classroom instruction, how to select an adequate and nutritious diet, stated Austin E. Hill, M.D., M.P.H., director of public school health services, Houston, Tex.

He suggested that schools sell only types of candy that contain ingredients which will supply needed nutrients, such as milk, egg whites, and peanuts or peanut butter, to aid in providing the child's daily protein requirement.

Pointing out the dangers of inadequate nutrition, he said that in this country only 35 percent of all school children have good diets. Poor nutrition, he maintained, is not solely an economic factor because many families in the lower income levels are well fed. The problem is not only one of educating children, parents, and teachers as to what constitutes a proper diet, Hill continued, but is concerned with application of the knowledge.

Hill defined the type of meals best adapted to supplying children with the daily nutrition requirements. In the table he gives the approximate daily caloric intake needed by children according to age.

He also compared the protein and caloric needs of school children with that of certain adults. For instance, he said a child between 7 and 9 years old needs as much food as the average middle-aged woman; a boy of 15 needs more food than his male teacher or athletic coach; and a 15-year-old girl needs the same amount of food as a pregnant woman. Most parents fail to understand that almost all school children actually need more food than their parents, said Hill.

### *Protein Essential*

Each day should begin with a good breakfast, high in protein content to help maintain a more constant blood level, Hill suggested. Children should eat at least three foods rich in protein at each meal to assure the full recommended daily protein consumption by bedtime.

"Protein is the most important diet constituent, and it is the most prevalent deficiency in the diet of school children," Hill declared. A steady loss of protein occurs in the body which must be replaced by a constant and adequate daily intake because proteins are not stored by the body as are carbohydrates and fats, he explained.

## School Lunchroom Survey Reveals Deficiencies

Periodic sanitary inspection of school lunchrooms and periodic review of the way the lunch programs are used for educational purposes were recommended by Charles C. Wilson, M.D., and Eric W. Mood, both of Yale University, on the basis of data collected in a 1954 survey of 795 schools. Dr. Wilson is professor of education and public health, and Mood is lecturer in public health.

These activities, preferably carried out cooperatively by school and health department personnel, will point the way for further specialized investigation and provide the bases for improved school sanitation and health education programs, they declared.

The following survey findings were reported.

### *Sanitation Practices*

Almost all the schools (731) have an adequate supply of running hot water, and 605 obtain their water from a public water source.

Forty-six percent of the schools have an installed dishwashing machine, and 19 percent, 3-compartment sinks, but 31 percent use 1- or 2-compartment sinks or dishpans.

To the question, "Are food displays covered or shielded by glass or plastic?" only 58 percent answered affirmatively.

Although only 2 schools specified that they did not use mechanical refrigeration, only 462 reported a thermometer in each refrigerator.

Almost half the schools (358) have an insect control problem, and approximately 1 out of every 3 (259) has a rodent control problem.

### *Health Education*

A majority of the schools (448) require pupils to wash their hands with soap and water before lunch, but 274 do not require this procedure.

Less than half (308) of the schools assign pupils to observe and report on food handling practices, and only about half (304) assign pupils to observe and report on pupil lunchroom practices.

In 50 of the schools, pupils assist in the preparation of food; in 368, they help in serving food; and in 524, they assist in cleaning up the lunchroom. In 518 schools, the children are instructed in sanitary procedures and reasons for the instruction are explained.

Sanitation in public eating places is studied in 64 schools "intensively"; in 543 "casually"; and in 104 "not at all."

### *Survey Methods*

In this survey, data were collected by two methods, Wilson and Mood specified. For 646 schools, questionnaires were filled out by members of the American School Health Association. For 149 schools, interviews were conducted by graduate students in public health and by health department sanitarians. Included in the survey sample, they stated, were elementary, junior high, and senior high schools in towns and cities of all sizes in all geographic areas of the Nation.

The increasing scope of school lunch programs was one factor stimulating the survey, they indicated. They estimated, from Department of Agriculture figures on the National School Lunch Program, that 1 out of every 3 school children eats his noon meal in the school lunchroom. Another factor was the occurrence of foodborne disease outbreaks attributed to food and drink served in the school lunchroom.

## School Children in Iowa Lack Calcium, Vitamin C

Even in seemingly well-fed Iowa, there are nutrition problems among school-age children which merit serious attention, according to the findings of a 5-year statewide research program.

Ercel S. Eppright, Ph.D., head of the department of food and nutrition, Iowa State College, reported on the study. The study, she noted, has been probing the tie between what children eat and their general state of nutrition.

Lack of sufficient calcium and vitamin C for all children was so frequent, Eppright said, that the problem might well be tackled in a statewide nutrition education program. For girls 12 years of age and older, lack of sufficient iron was a frequent finding.

Iowa school children tend to follow the eating patterns previously observed for their parents, she stated. They are eating well of such foods as meat, potatoes, fats, and bread and other cereals, but they are not getting enough milk, fruits, and vegetables, the study revealed.

Eppright reported that the mean nutritive value of the diets of the children (except girls over age 12 years) was close to or better than the recommended daily allowances of the National Research Council. This finding, however, could be termed "false security," she noted, for "there is a fairly large proportion of children whose diets are not well-fortified by certain nutrients."

According to analysis of finger-tip blood samples, vitamin C nutrition was found to be less than optimum for many children and actually poor for approximately one-fourth, she specified. A lack of carotene-rich fruits and vegetables in the diets of many children also produced results evident on analysis of blood samples.

### *Teen-Age Girls*

Most conspicuous for poor diets were the teen-age girls, Eppright emphasized. More than half had diets which appeared to be grossly inadequate. She pointed out that this is a particularly critical group since it concerns the well-being of the future generation.

Among the teen-agers, overweight girls were conspicuous for their poor diets, she said, suggesting that concern about overweight should focus attention on the inadequately nourished, overweight teen-ager.

Concerning physical development, Eppright reported that the children appear to be growing satisfactorily according to standards of physical fitness. Children with liberal diets tend to be slightly taller, heavier, and larger in leg girth than children whose diets are somewhat below the recommended dietary allowances, she noted.

The study, she said, has pointed to the importance of keeping systematic records of height and weight of children. She recommended that schools follow such a procedure as part of their school health program.

The most conspicuous physical defect found on clinical and dental examination, she added, was poor teeth. More information is needed about the impact of the nutrition of children on the condition of their teeth, she declared.

# Use of Exhibits, Publications . . .

*Prenatal pamphlets, workable "suitcase" exhibits for children, modern format for medical and public health publications, and the need for coordinated efforts of various agencies in health education programs are discussed.*

## Prenatal Pamphlet Series May Benefit Mothers

A series of prenatal pamphlets was found in a recent study in New Orleans, La., to have some effect on the knowledge and attitudes of expectant mothers, according to Loyd W. Rowland, Ph.D., director, Louisiana Association for Mental Health, and Joseph F. Follettie, M.S., lecturer in social research, Tulane University Graduate School of Social Work.

This conclusion was based on the responses of 51 mothers who had received the series and a control group of 95 mothers to 55 questions relating directly to the series materials. The showing made by the two groups favored the experimental group for 39 questions and the control group for 15, they stated, pointing out that the difference between 39 and the number of questions for which the responses would be expected to favor each group, 27, is significant at the 0.001 level. Only 2 of the questions, taken individually, showed a statistically significant difference at the 0.05 level, they added.

They reported that the two groups were selected from among 436 mothers who had had first babies in private hospitals in the city during a 2-month period. The groups were fairly well equated as to amount of reading other than the series materials, employment of the father, and income, they said.

They suggested, however, that the following procedures might yield a more definitive study of the prenatal materials: interviewing the mothers immediately before the birth of their child; selecting experimental and control groups from the same statistical universe; selecting sample groups racially and socioeconomically representative of the statistical universe from which they are drawn; and using professional interviewers.

Concerning the first suggestion, Rowland and Follettie pointed out that the interval of time transpiring between the birth of the child and the time of the study may have decreased the chances of getting favorable results. There is a medical tradition that regardless of anxieties beforehand and the unpleasantness of the birth process there is a conscious effort on the part of the mother to forget all of it, they explained.

### *Acceptance by Authorities*

Noting the difficulty of measuring knowledge of learned material and the even greater difficulty of measuring attitudes, Rowland and Follettie suggested two criteria that they believe are fairly reliable for judging educational materials: the acceptance of the material by authorities in the field and the popularity of the material with those expected to use it.

Applying the first of these criteria to the prenatal pamphlets, Rowland and Follettie asked 100 physicians who distributed the materials to their patients for their opinion of the materials. Forty-five responded, all favorably, the responses ranging from a simple "good" or "continue" to lengthy commendations, they said.

Efforts to determine the effectiveness of what is being done in the health education field should not be relaxed, they declared. Each evaluation study, they said, helps to develop standards and thus benefits the whole health education movement.

## Modern Formats Attract Responsive Readers

Pamphlets and magazines which aim to inform busy members of the medical and public health professions should be as smartly designed, as well written, and as attractively illustrated as the sales pamphlets, literary and picture magazines, and other printed matter which compete for attention. Publication figures and reader surveys confirm this, according to Russell W. Cumley, Ph.D., director of publications at the University of Texas M. D. Anderson Hospital and Tumor Institute, and executive editor of *The Cancer Bulletin*.

A dynamically designed and illustrated pharmaceutical publication stimulated an unprecedented increase in sales of the manufacturer's products, he said of a journal with which he was previously associated. Accordingly, it was decided to publish *The Cancer Bulletin* in contemporary format, assuming that this would attract more readers.

Originally distributed to 7,500 Texas physicians, within one year the circulation jumped to 100,000, as requests for copies were received from physicians and cancer control agencies in other parts of the United States and in many foreign countries, Cumley stated. Regional reader surveys indicated that 50 to 90 percent responded, an extremely high percentage. Nearly 90 percent of the responding physicians indicated that the periodical aided them in their practice.

Articles usually have a large and provocative illustration on the first page, Cumley said. This draws attention to the title. Primarily designed to induce further reading,

the title does not necessarily indicate the content of the article. A subtitle takes over this function. If no subtitle is used, the title itself must fill this need and lead the reader to the first paragraph. This paragraph presents the general substance of the article and should assure that continued reading will be beneficial. The remainder of the article proceeds swiftly to present its case with as few words as possible.

Journalistic presentation throughout does not compromise scientific integrity and, when the last paragraph is reached, Cumley stressed that the reader should be left with a feeling that he has benefited by the reading.

## Health Museum Designs 3–D Suitcase Exhibits

Suitcase exhibits with three-dimensional models are being used in the health education area served by the Cleveland Health Museum, Cleveland, Ohio. Unique in school health education, and still experimental, the series is proving to be a fascinating and practical way of having children visualize health concepts, according to the museum's curator of education, Winfield G. Doyle, Ed.D.

Children like exhibits they can work themselves, Doyle said. A child can touch and work any of the 14 exhibits in the museum's current series on good health habits and the science of the body. The exhibits were displayed at the annual APHA meeting.

The series has been developed for classroom use at many grade levels. Although designed originally to meet local needs, it can be expanded to include more specialized topics. Standard-sized suitcases hold most of the exhibits. Few weigh more than 50 pounds apiece. All come equipped with leather carrying handles. None is too big for a teacher to handle. All displays are large enough to be seen in the average classroom.

Instruction aids, such as charts and diagrams, are part of the exhibits. A master magnetic tape has been prepared for each suitcase, describing the exhibit in detail, and giving teachers pointers on what to stress at different grade levels as well as suggestions for coordinating class projects. The teacher can review the subject matter on the tape before taking the exhibit into the classroom.

### *The Visual Appeal*

Some of the exhibits are designed for the youngest pupil to understand, Doyle said. Captions are simple and interest-provoking. All exhibits use cheerful color combinations. Children are given a chance to eat unfamiliar foods and to correct poor eating habits at "tasting parties," in connection with one exhibit, "Foods Can Be Fun."

Some of the exhibits rely on swinging or removable panels to unfold a complex idea or to highlight the difference between desirable and undesirable habits. "Rest and Sleep" uses a window shade to suggest the familiar act of pulling down the shade in a child's bedroom before he retires.

Some of the models of the organs of the body are completely dissectible. The ear model in "How We Hear" comes apart so that it can be used for discussion of the structure of the outer, middle, and inner ears.

When a button is pushed in the posture exhibit "Straight and Tall," a boy standing straight like an "I" slumps into curves like an "S." The exhibit "Teeth Are To Keep" has models of a molar, an articulated denture, and a few common dental instruments, such as a mouth mirror and saliva extractor.

The eye and ear exhibits also aid the school or public health nurse in her screening and testing. In "Why We Need Glasses," nearsightedness, farsightedness, astigmatism, and double vision are shown. Diagrams showing these defects are on one panel, while on the right, the same scene has been photographed as it would appear to persons having these defects. Plastic slides hang on pins over the eyeballs to show how the defects are corrected with lenses. A dissectible eyeball is included along with a Snellen chart, a series of color cards for testing color vision, and a near-vision chart.

## Health Education Programs Need Coordinated Effort

All persons in the education, public health, and welfare fields must work together if health education programs are to be complete, declared Dora A. Hicks, Ed.D., chairman, professional health education, University of Florida. Cooperative and coordinated planning techniques are needed to prevent duplication of some procedures that are necessary to solve the health problems of students and to avoid omission of others, she said.

A technique for evaluating school health programs which will eliminate subjective judgment as far as possible and will show results of health education in terms of actions and accomplishments has been needed for some time, Hicks continued. Periodic systematic examination of health programs will yield information that will be helpful in future planning, she stated.

Hicks described the development of a technique for self-evaluation of the entire school health program. This technique, she said, is apparently more objective and more adequate than any that has been reported so far and should serve as a guide for evaluating any school health program. Development of the technique included a review of the literature; establishment of a list of accepted standards, policies, and procedures for adequate school health programs; construction of a survey form; and preparation, comparison, and evaluation of the data.

### *Sources of Standards*

A number of sources related to school and community health were consulted in developing the evaluation technique, Hicks said. Among these were reports and studies by

professional organizations; surveys of health practices; studies on legislation and State regulations; health education textbooks; group reports and studies on special problems, such as organization, administration, and supervision; and conference reports.

Hicks stated that a full report of the development and application of the self-evaluation technique of school health programs and the results obtained is contained in an unpublished study, "Evaluation of an Inservice Program for Improvement of School Health Education."

# Food and Milk Sanitation . . .

*Although progress was reported in restaurant sanitation, there remains a job to be done, especially in educating restaurant workers. Take-out foods are receiving increased attention. Improvements in milk sanitation equipment and methods were discussed and Missouri reported on its experience with an approval program for local milk laboratories.*

## Local Milk Laboratory Approval Program

Experience in trying to organize a local milk laboratory approval program in Missouri has shown that a 20-percent deviation from the State laboratory findings would be a practical standard, according to Irma C. Adams, B.S., director, bureau of laboratories, and William J. Beck, M.S., bacteriologist, Missouri Department of Public Health and Welfare.

The organization of the approval program included development of a method for performance of tests on split milk samples by the local and State laboratories for control purposes, they related. It was found that the standard of agreement—within 10 percent deviation—between State and local laboratories, as had been previously suggested, would be impossible at this time for the laboratories in Missouri, they declared.

### *Program Preparation*

The first step taken to develop the Missouri approval program was to give a series of workshops on the actual techniques and tests performed, they related. As it was impossible for all the technicians to attend the workshops in 1950 and 1951, during 1952 and 1953 local laboratories were visited by State laboratory personnel and surveyed, using the Public Health Service form, on equipment and methodology, they explained.

This second step revealed that only 10 of 22 laboratories visited had satisfactory compliance. The largest deviations found through the survey forms, next to keeping records, were in the apparatus used, plating techniques, and variations of incubation temperatures, they reported.

### *Split Milk Samples*

The third step in the laboratory approval program was the development of a plan for utilizing split milk samples, Adams and Beck reported. Two or three of a given amount of known organisms, *Escherichia coli*, *Micrococcus pyogenes aureus*, *Streptococcus liquefaciens*, and *Sarcina lutea*, were added to cold sterile skim milk, they said.

Under carefully controlled conditions, this mixture was divided into samples in test tubes, quick frozen, and after packing in dry ice, was sent to the pilot laboratories. At a given time the next day, when all samples could be presumed to have been delivered, a standard plate count was performed adhering to the Standard Methods for the Examination of Dairy Products with one exception, they related.

Results on the first 50 split milk samples, they reported, were as follows: Laboratory A agreed within 10 percent with the control laboratory on 81 percent of 31 specimens tested; laboratory B, on 64 percent of 50 specimens tested; laboratory C, on 70 percent of 50 specimens tested. These laboratories could reproduce the results of the control laboratory within 10 percent 73 percent of the time, within 15 percent, 83 percent of the time, and within 20 percent, 93 percent of the time on the average.

Tests with a second group of 25 split milk samples did not yield any greatly improved results, although modifications to improve the agreement between laboratories were made, they reported.

## Food and Beverage Council Objectives Explained

Existing ordinances and codes governing sanitation requirements in public and private eating establishments should be reevaluated in the light of present-day conditions and new knowledge, stated Henry F. Vaughan, Dr.P.H., dean, University of Michigan School of Public Health, and president, National Sanitation Foundation, in discussing the food protection program of the National Food and Beverage Council.

The National Food and Beverage Council was organized in 1953, Vaughan reported, under the joint auspices of the National Restaurant Association, the American Hotel Association, the Public Health Service, the National Sanitation

Foundation, and State and local health services. The council's purpose is "to encourage people to know the value of and to demand quality food, well prepared, served in a clean and sanitary manner in clean, pleasant surroundings, whether at home or any other place where food and beverages are served," he said.

### *Sanitation Pattern*

Vaughan summarized the council's activities as follows:

1. Developing of voluntary and coordinated leadership among health authorities, industry representatives, other groups, and individual citizens.

2. Obtaining endorsement and support from food and beverage associations, individual companies, and members of the public.

3. Developing educational material and instruction aids to be used at all educational levels.

4. Forming a permanent staff to launch and keep the program going in all of its phases.

5. Establishing pilot programs in representative communities and working out details of activating communitywide educational programs with State and local leadership.

Vaughan suggested the issuance of a guide or manual which would combine the best features of existing food and beverage service regulations and provide a uniform sanitation code for communities and industry to follow. He felt such a manual should be prepared through the joint efforts of the leading food and beverage industries and Federal and local public health organizations. Continued research, he said, should provide up-to-date technical data to keep the food protection program effective and nationally acceptable.

## Notes Equipment Advances In the Dairy Industry

Reviewing methods and equipment which have been introduced into the dairy industry during the past 10 to 15 years, H. L. Thomasson, executive secretary for the International Association of Milk and Food Sanitarians, Inc., named the bulk farm cooling tank as probably one of the outstanding developments.

Significant features of the bulk farm cooling tank, Thomasson noted, are fast cooling, ease of cleaning, elimination of the use of heavy cans, and minimum exposure of the milk to contamination. The use of this tank also eliminates the need for can washers in the pasteurization plant and for the handling of empty return cans, he said.

Other developments that Thomasson considered noteworthy include the following: the farm tank pickup truck; cleaned-in-place pipelines; bulk milk dispensers; improvement of dairy herds through artificial insemination; the Ring test for brucellosis; vacreators; high-temperature, short-time, continuous flow pasteurizers; automatic feeders for the addition of vitamins; improved cleaning compounds; the formation of the 3A sanitary standards group; and the use of paper containers in the distribution of milk.

Although bulk milk dispensing is not new, this type of milk distribution has been greatly improved, Thomasson specified. Pointing out that the filling of cans at the pasteurization plant has been one of the knottiest of sanitation problems, he reported the recent development of an automatic can filler that operates in the same manner as a glass bottle filler and thus eliminates the need for filling cans manually.

### *New Fortification Method*

Thomasson also reported that a new method has been devised for continuous flow fortification of milk with vitamin additives. The device is the first with design and operating principles acceptable to sanitarians, he stated. He explained that with batch fortification, the sanitarian has little opportunity to check the actual performance of fortification unless he happens to be present during the process. With the new method, the sanitarian has an opportunity to see whether fortification is being done in the proper manner since the unit operates continuously during pasteurization.

The 3A sanitary standards group, formed in 1941, is helping to eliminate what once was a major problem in the dairy industry, that is, the necessity for manufacturing equipment to meet a variety of health requirements, Thomasson indicated. This group, composed of 3 committees representing various organizations, has established 16 standards and 3 revisions covering types of materials, finish, fabrication, construction, and other design features for various kinds of equipment, he stated. Although progress is sometimes slow, eventually all diary equipment will be covered by the standards, he declared.

Remarking that research on methods and equipment is going on all the time, Thomasson mentioned sonic pasteurization (destroying bacteria by sound waves) and radiation sterilization (sterilization by light waves, infrared, or similar means) as among the areas being studied today.

## Sanitation Problem Seen In Take-Out Foods

Serve-yourself freezers and rotisseries provide marketing conveniences but pose another problem—that of sanitation of take-out foods, according to one report.

The report was made by Charles L. Senn, director of the sanitation bureau of the Los Angeles City Health Department, and Col. Paul P. Logan, director of research, National Restaurant Association. They are cochairmen of the Committee on Research of the National Food and Beverage Council.

The extent of the problem can be seen, Senn and Logan said, by the production of frozen pies which in 2 years has accelerated ten times to 250 million units in 1954. Another

factor is the increase in number of restaurants which have factories for the production of take-out foods which are becoming ever more popular with the industrial worker.

Although local health departments devote much time to restaurant and food processing sanitation, there is need for a similar amount of time and effort to be given to the supervision of "take-out" foods operations, Senn and Logan said.

Other points of their discussion of the problem included the following:

The frozen food industry must recognize certain dangers and be on guard against them. Among these are: various paratyphoid organisms in eviscerated poultry; paratyphoid and typhoid bacilli surviving for long periods of time in frozen foods; the botulism organism and its toxin which remain potent after prolonged freezing.

In some plants, as many as 25 pairs of hands work over take-out chicken pies, as the ingredients move along the assembly line.

Field inspections showed that the poultry and other raw ingredients were of reasonably good grade, but there were no official, routine inspections at some plants.

High standards can be reached. One study with cold and hot packed samples showed that the product packed hot was practically sterile, they said, while the cold products averaged 4,000 to 6,000 organisms per gram on bacteria plate counts.

Proper packaging, clear labeling, and public education can help solve the consumer's problems. No matter how sanitary the product is, it can become spoiled if kept too long at room temperature.

The Los Angeles area has improved sanitation factors in the industrial catering business. New regulations permit handling hot foods on a trial basis, provided hot foods not sold on the first day are discarded.

Rules for the installation and operation of rotisseries afford reasonable control up to the time the food is sold.

# Water Pollution Control . . .

*Topics included in this section are tests to detect water pollution and to trace infectious agents, the plentiful use of water as a shigellosis preventive, the Southwest's water supply shortage, and sewage management.*

## Plentiful Water Supply May Reduce Shigellosis

Lack of water for personal hygiene and laundry may be a significant factor in the prevalence of *Shigella* infections, according to the findings of 1952–53 studies among residents of migratory farm labor camps in Fresno County, Calif.

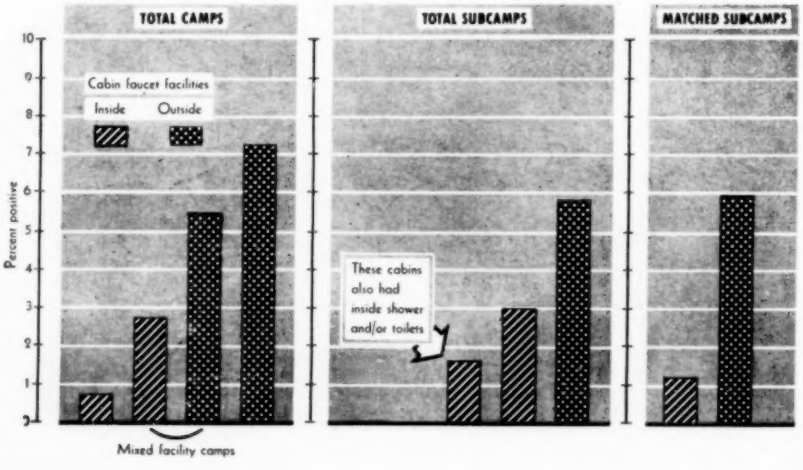
The study was reported by A. C. Hollister, Jr., M.D., M. D. Beck, M.A., A. M. Gittelsohn, M.P.H., and E. C. Hemphill, M.P.H. They said there were no other environmental factors to explain the association between availability of water and the number of *Shigella* infections found in these camps.

Dr. Hollister is chief and Mr. Beck and Mr. Gittelsohn are with the bureau of acute communicable diseases, California State Department of Public Health. Mr. Hemphill is with the Epidemiology Branch, Communicable Disease Center, Public Health Service.

Hollister and his co-workers reported that in the 70 camps studied during a 7-month period, the proportion of persons with positive *Shigella* cultures varied inversely with the availability of water. In camps in which all cabins had either private or inside water faucets, 0.7 percent of the cultures from individuals were positive. However, in camps in which none of the cabins had inside water faucets, the rate was 7.2 percent positive.

The investigators said that the rate of prevalence of *Shigella* infections ranged from 1.6 percent in cabins with complete inside plumbing to 5.8 percent in cabins which had no inside plumbing. Among the cabins which had inside water faucets only, with other facilities outside and available for communal use, 3.0 percent of the cultures were positive, they said.

**Shigella positivity rates, by water availability.**



Results of a study of the relationship between prevalence rates of *Shigella* infections and the amount of water available for personal hygiene in southern Georgia confirm the findings of the Fresno County investigators, Hollister and his co-workers stated.

### *Environmental Control*

The findings of the California and Georgia studies indicate that when water is used for washing and bathing, it can aid in the reduction of intestinal infections, acting as a diluent instead of as a vehicle for the transmission of pathogenic organisms, they continued. The implication is that the relatively inexpensive provision of plentiful and easily accessible supplies of water will bring about significant improvements in the control of *Shigella* infections.

Hollister and his co-workers said that these studies are the first organized efforts "to isolate some of the elements of environmental sanitation and personal hygiene practice and to begin to evaluate them in order of preventive importance for a particular disease entity," and that "only by defining such fundamentals can programs for improving the health status of depressed populations anywhere be brought to maximum efficiency."

In conclusion, they said that this hypothesis must be subjected to critical tests in the field, possibly in several situations in various parts of the world, and suggested that it might be desirable to include other diseases than shigellosis in these tests.

## Trace Infectious Agents By Sewage Sampling

Results of three projects illustrate the suitability of the swab technique for sampling sewage and, in combination with appropriate isolation methods, for isolating infectious agents which may occur intermittently in sewage, according to Sally M. Kelly, Ph.D., Mary E. Clark, and Marion B. Coleman, division of laboratories and research, New York State Department of Health.

The swab technique, as suggested by British workers, offers a practical approach to the problem of searching for *Salmonella* carriers among groups of food handlers, they declared. The ease and safety with which the swabs may be handled cannot be ignored, they added.

### *Salmonella Typhosa*

After the occurrence of a third case of typhoid fever in the vicinity of a stream into which the effluent of a town's sewage treatment plant was discharged, they related, a search for the carrier of typhoid bacilli, phage type $D_4$, was instituted.

Strips of gauze, 6 by 48 inches, were folded to make swabs and sterilized, then immersed in sewage at points which covered a specific street, they reported. After 4 days' immersion the swabs were removed and each swab was placed in glycerol solution and received at the laboratory within 24 hours, they said.

*Salmonella typhosa* was isolated from 10 of 29 specimens, including one from the sewage drainpipe of a nursing home, but not above this point in the sewerage system. The carrier was discovered in the nursing home, they reported.

### *Coxsackie Viruses*

A study of the distribution of Coxsackie viruses in sewage, using the catch and swab sampling methods, showed that the swabs yielded viruses more consistently than the samples taken by the catch method, they reported, and that:

Coxsackie viruses are found in sewage from June through November, the peak occurring in late July and early September. The viruses were recovered in 7 of 9 sewage plants examined "in season." During December through May, the viruses are found only sporadically, if at all. The viruses are not destroyed by sewage treatment, in particular, by Imhoff tank sedimentation and certain phases of secondary treatment. The viruses occur intermittently during the daily flow, and more than one serologic type may be present in a sample.

### *Tubercle Bacilli*

Specimens from the sewage of two treatment plants which serve large tuberculosis hospitals were examined to determine the effect on tubercle bacilli of primary and also secondary treatment, consisting of trickling filter clarification followed by chlorination, they stated. The findings show a decrease in the number of tubercle bacilli by both methods of sewage treatment, they reported, but neither method is entirely effective.

## Tests Favor Enterococci As Pollution Signals

Reconsideration of the use of the enterococcus group of bacteria as indicators of sewage polluted water is advocated by Warren Litsky, Ph.D., and W. L. Mallmann, Ph.D., as a result of a 2-year study of Connecticut River samples.

Dr. Litsky, associate research professor, University of Massachusetts, and Dr. Mallmann, professor at Michigan State College, found an enterococcus density approximately 7.6 times that of *Escherichia coli*, the organism commonly used to indicate water pollution. In a statistical analysis of the bacteria determinations, they demonstrated a definite relationship between the two types of organisms. The increase in the *E. coli* index, they said, was generally followed by a predictable increase in the enterococcus index.

During the 2-year period, water samples were collected at least twice monthly from 14 stations in areas of both low and high pollution along the Connecticut River in the vicinity of Northampton, Mass. The 7.6 to 1 ratio of enterococci to *E. coli*, the highest reported ratio thus far, is

based on the median value of all samples collected in the study.

This finding, Litsky and Mallmann said, "suggests that the enterococcus organisms be taken out of the realm of stepchildren and given their legitimate place in the field of sanitary bacteriology as indicators of sewage pollution." They pointed out that enterococci have been found to be abundant in fecal matter, but, unlike the coliform bacteria, they have not been found anywhere in nature.

### *Superior Medium*

They attributed their results to the use of a superior medium for detecting and enumerating enterococcus organisms. Azide dextrose broth (Difco) was used as a presumptive test for the enterococci and ethyl violet azide broth as a confirmatory medium.

The low numbers of enterococci recovered from sewage and polluted water in several previous investigations, they believe, was due to the failure of the media employed for their isolation and not to the low numbers of the organisms. Cited as an example was the 63 to 1 ratio of *E. coli* to enterococci reported by Lattanzi and Mood in a 1951 study of water samples taken from the harbor at New Haven, Conn. The Winter and Sandholzer technique was used on the harbor water samples.

Leading to a review of the coliform-enterococcus ratio in sewage polluted water, they related, was the earlier demonstration by Mallmann and Seligmann that azide dextrose broth was far superior to other media for the detection of streptococci in water and sewage. Using this medium, Mallmann and Litsky recovered about the same number of coliform bacteria and enterococci (intestinal streptococci) from soil freshly treated with sewage.

Because the azide dextrose broth supported the growth of a few other nonstreptococcal forms, Litsky, Mallmann, and Fifield developed ethyl violet azide broth as a confirmatory medium. The presumptive and confirmatory media, it was reported, detected 100 to 10,000 more enterococci in polluted water than were detected by other methods.

Litsky and Mallmann concluded that more work must be done along this line if the isolation and detection of enterococci is to become a method useful in sanitary bacteriology.

## Limited Use Credited To Ultraviolet Purifier

In the event of an emergency involving failure of municipal supplies, naturally contaminated water can be made safe for human consumption by the use of an individual ultraviolet purifier.

Such an apparatus was described and results of the first systematic study on factors influencing the ability of ultraviolet radiation to kill bacteria were presented in a report made by the following: H. C. Ricks, M.D., M.P.H., director of laboratories, T. D. Labecki, M.D., medical consultant, F. J. Underwood, executive secretary, and G. R. Reeves, senior bacteriologist, Mississippi State Board of Health, Jackson, Miss.; and J. R. Cortelyou, Ph.D., chairman, department of biological sciences, M. A. McWhinnie, M.D., associate professor of biology, and J. E. Semrad, Ph.D., professor of biology, DePaul University, Chicago.

The purifier is particularly useful in areas where it is difficult to solve problems of water supply by sanitation and engineering measures. With an adapter and a standard automobile electrical system, it can also be used to purify water during camping, hunting, and fishing trips, and in areas where drinking water is unsafe.

### *Radiation Intensity*

Although the purifier has certain definite limitations, these are clearly stated and are provided for in the apparatus. The report said that even heavily contaminated water can be safely purified by this means, provided that adequate intensity of radiation is established and maintained. This will depend on several factors: number of hours the lamp used has been burned; maintenance of proper line voltage and water temperature; effect of mineral and organic content of the water on transmission of radiation; differences in the resistance of various bacterial species to ultraviolet radiation; duration of exposure of all particles of water to the germicidal energy of the ultraviolet rays; and observance of certain precautions by operators of the apparatus.

Results of laboratory and field tests refute statements that various circumstances may make it impractical to purify water by ultraviolet radiation, Ricks and his associates reported. Apparently proper design of the purifier will compensate for these limiting factors.

They warned, however, that purification of contaminated water on an individual consumer basis should not be allowed to replace sound public health measures for the provision of safe public water supplies and that the purifier should not be considered a replacement for efforts to improve individual sources of water.

## Urges Sanitation Studies In Hepatitis Research

The actual number of cases of infectious hepatitis resulting from waterborne virus is undoubtedly much greater than the number reported, according to C. H. Connell, Ph.D., professor of sanitation, department of preventive medicine and public health, University of Texas School of Medicine, Galveston.

More precise recognition of the disease and better reporting of cases is one of the prerequisites for adequate epidemiological studies of this disease, he asserted. A second prerequisite, he said, is the development of methods for titrating the virus other than by use of human volunteers.

The epidemiologist should take the lead and, with other members of the health team, obtain a better evaluation of environmental factors important in transmitting the disease, he declared.

### *Needed Research*

In the field of water and sewage purification, Connell asserted, the following research investigations are needed:

Measurement for effectiveness in removing and inactivating hepatitis virus under conditions approximating those of plant-scale operation of water treatment processes, coagulation, sedimentation, filtration, and chlorination; evaluation of the effect of pH upon those processes; and a more precise evaluation of the effects of chlorine, particularly when free chlorine alone is present; a similar comprehensive study of the effectiveness of sewage treatment processes; and an evaluation of bacteriological coliform test as an index of fecal contamination in relation to the presence or absence of hepatitis virus in water.

## Septic Tank Failures Cause Concern

Outlining the tentative recommendations of the APHA Committee on Rural Sanitation, its chairman, John E. Kiker, M.C.E., professor of civil engineering, University of Florida, asserted, "Septic tanks and subsurface sewage disposal systems are poor substitutes for central collection systems and treatment facilities."

There is no substitute for the application of basic engineering principles in the proper design of subsurface sewage disposal systems, he added. As a result of many failures, which may be attributed to a disregard of these principles, septic tanks have fallen into disrepute in recent years.

Most of the septic tank failures have occurred in suburban areas where public sewerage facilities should have been required, he noted. Unfortunately, Kiker commented, few health departments have the authority to require such facilities where they are needed, and it is doubtful whether the number of sewerage systems will ever be enough to supply the needs.

The nuisances caused by overflowing sewage at private dwellings are found mainly at project subdivisions and could be prevented by proper planning and enforcement of regulations, he stated.

As two-thirds of the houses being built are in suburbs not served by public sewers, the Nation faces the problem of making the best of a bad situation for years to come, he said. Sewage overflows will probably continue to be the most common public health nuisance, but it will be possible to minimize such nuisances through the exercise of judgment and adherence to basic engineering principles, he commented.

### *Use of Septic Tanks*

In general, Kiker said, septic tanks should be used only in rural areas of large acreage where suitable soil for disposal of the effluent is available. The tanks should not be used where the soil is impervious, where the ground water table comes within 4 feet of the surface during the wettest season, where the subsoil is otherwise unsatisfactory, or where there is any likelihood of contaminating a body of water.

All subsurface disposal systems, he continued, should be designed on the basis of percolation tests made in the soil after thorough saturation. In the case of shallow devices for sewage disposal, the soil characteristics for a depth of at least 5 or 10 feet should be determined. Underground characteristics and percolation tests should be correlated in estimating the probable life of a subsurface disposal system, he said.

Kiker outlined preliminary considerations in designing septic tanks and subsurface sewage disposal systems: percolation tests, estimates of sewage quantities, area and distance requirements. He also cited 18 standards which have been successful in some places.

The reporting committee was composed of A. N. Best, Robert N. Clark, William T. Ingram, Robert W. Lamberton, Louva G. Lenert, Harvey F. Ludwig, Joseph A. Salvato, Jr., James R. Simpson, and Samuel R. Weibel.

## Southwest's Water Supply Problems Are Increasing

By the year 2,000, nearly three times as much water will be needed in the Arkansas-White-Red River Basins as is needed today. These potential water supply requirements, especially for industry and municipal use, will present a problem to all public health agencies, particularly State health departments, stated E. C. Warkentin, B.S., M.P.H., E. P. Sellner, M.S., and H. W. Poston, B.S.

Mr. Warkentin is officer in charge and Mr. Poston is assistant basin engineer, Lower Mississippi and Western Gulf Drainage Basins Office, Public Health Service, Little Rock, Ark.; Mr. Sellner is the Public Health Service representative on the Domestic and Industrial Water Supply Group.

### *Surface and Ground Waters*

Surface water problems vary in the three river basins, Warkentin and his colleagues said. In the western half of the area, rainfall is low most of the year, and at times, water may be unsatisfactory or even unusable. In the eastern half, most of the streams have a continuous flow, but during dry periods, the smallest streams cannot be depended upon unless the water is impounded.

Natural salinity and disposal of industrial wastes and municipal sewage affect the chemical quality of the water, and storage reservoirs in the Arkansas and Red River Basins must have a large capacity to allow for the accumulation of sediment.

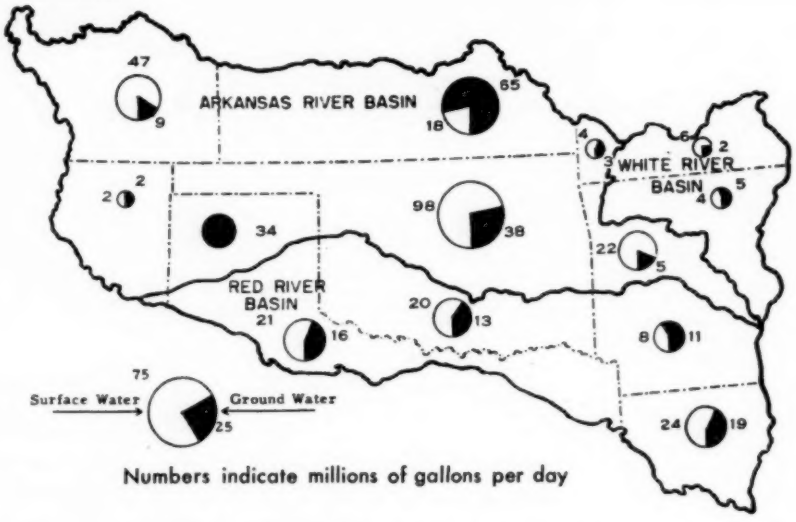
The quality, quantity, availability,

and suitability for domestic and industrial uses of ground water vary with the character and productivity of the ground water provinces traversed by the major rivers in the basins, Warkentin and his co-workers said.

Oil brine has damaged ground water in some areas; in others, natural pollutants have resulted in poor quality of water. In rural communities, water in more than half the wells is unsafe for human consumption, and in some areas, no water is available and supplies must be hauled in.

Warkentin and his colleagues recommended further investigation of the feasibility of replenishing ground water supplies in areas where they have been depleted by intensive irrigation of rice.

**Municipal water use from ground and surface sources in the Arkansas-White-Red River Basins, by State sections of drainage basins.**




Numbers indicate millions of gallons per day

### *Possible Solutions*

Some industries and municipalities can increase existing sources of water supply; several multiple-purpose reservoirs in the basins have storage capacity or maintain a low flow of water for pollution abatement and water supply; 11 reservoirs have been authorized or are recommended for Federal construction; and legislative authority has been given to modify some reservoirs, provided certain conditions are met by States, municipalities, and local agencies, Warkentin and his co-workers reported.

They said that 40 reservoir projects with a total storage capacity of more than a million acre-feet, which could be used by 75 or more communities, are apparently economically feasible in this area, that hydroelectric storage power would amount to 1,726,000 acre-feet, and that water releases from power production could be used for water supply purposes.

They also stated that water from a sparsely settled area in the Red River Basin which has an abundant supply of excellent quality water from the combined flow of four rivers may eventually be pumped as far as 150 miles from its source.

Warkentin and his colleagues said that the States in the Arkansas, White, and Red River Basins and the Arkansas-White-Red River Inter-Agency Committee have been studying the problems of water resources and supplies in this area since 1950. The committee's report and plan for the development of water and land resources in these river basins is to be presented to the Congress on June 30, 1955.

# School Health Practices . . .

*Rochester, N. Y., finds no special case-finding value in the school medical examination of first grade children who had been examined a year before, and Stanford University finds no special benefit in separate classes for the child who has had rheumatic fever. Minnesota University's unusual health service has been designated a local health unit.*

## New York Studies Role Of School Medical Exams

A study in Rochester, New York, has found that a school medical examination of first grade children who have been examined in kindergarten is valueless from a case-finding standpoint, according to a report by Alfred Yankauer, M.D., M.P.H., and Ruth A. Lawrence, M.D.

Dr. Yankauer is director, bureau of maternal and child health, New York State Department of Health, and Dr. Lawrence is pediatrician, Rochester Health Bureau, and instructor, University of Rochester School of Medicine and Dentistry.

Of 997 previously examined children, 210 had adverse conditions,

they specified, but 164 of these were already under medical care and 25 were already known by the school health service to have the adverse condition.

Of the remaining 21 children, only 1 had a serious condition which had developed since the previous examination and which could not have been observed by a classroom teacher, they noted. This child had epileptic seizures which occurred only at night. Two other children of the 21 had Baker's cyst of the knee.

These data were obtained, Yankauer and Lawrence explained, from the first of four examinations that have been or will be made each year on the same children. In addition, each year after the first, a control group of children at the same grade level but in other schools will be examined. The prevalence data from the first examination serve primarily to provide a baseline for analysis of future findings, they pointed out.

To define more accurately the role of periodic medical examinations in the school health program and to clarify the role of the school physician were given as objectives of this 4-year study. It will explore some of the following questions, Yankauer and Lawrence said:

Are the traditional purposes of a periodic medical examination (to detect adverse conditions, to advise concerning the need for care, and to educate parent and child) realistic today? How necessary is periodic examination of the entire school population for detecting adverse conditions? How frequently should medical examinations be performed to achieve their stated purposes? What is the annual increment of adverse conditions detectable only by medical examination? How many conditions detected by the medical school examination are already under care?

*Study Methods*

Medical examinations performed for this study consisted of a complete and careful medical history and a physical examination of all systems, they specified. Included in the report, however, were data only on conditions the detection of which requires the skill of a physician. Tests for visual acuity and hearing loss and other laboratory screening tests, such as urinalysis and tuberculin tests, were not performed.

The study group for the first examination was composed of 1,056 first grade children (including 59 not previously examined), 97 percent of the 1952–53 first grade population of 13 schools in Rochester, N. Y., they stated. From each of three socioeconomic groups of schools, four or more were selected so that the first grade population in each group would represent a 15-percent sample of the total first grade population of that group.

## No Advantages Shown In Health Class Study

The postrheumatic fever child benefits no more from special health classes than from regular classes, Raymond George Nebelung, Dr.P.H., Ed.D., department of public health and preventive medicine, Stanford University School of Medicine, maintained in describing a 2-year study made of 444 such children in San Francisco.

To determine the value of special education over regular school routine, the study grouped the children in two sections: (1) health classes with a curtailed school and activity program; and (2) regular classes with the normal type of school activities.

Features of the special health classes included special teacher training in education of the handicapped child, small classes, modified teaching program, shorter school day, scheduled rest periods, and a supplementary nutrition program. In the regular classes no restrictions were put on the postrheumatic child's activities, Nebelung said.

Cardiac classification categories were set up for the two types of classes, using for each child the original and current classification data from the cardiac registry of the San Francisco Board of Health. No case was selected for the study until at least 1 year had elapsed following the child's illness. The physician's physical finding on examination of each child determined the child's classification.

The data for the two groups were compiled in terms of retrogression, no change, or improvement in the child's condition. Analyses of the data showed no significant differences in degree of improvement existing between the members of the health classes and the regular classes for the various years studied, Nebelung stated.

However, supervision of the physical activities of the postrheumatic fever child is essential, Nebelung stressed. The child must be taught to recognize his own capacities and to conserve his energy while the damaged heart muscle is repairing. The question becomes one of types and amount of exercise in which the child should be encouraged to participate. But, at present, no specific technique is available to measure accurately the functional capacity of the heart.

Nebelung urged both physical educators and physicians to strive for improved techniques for classifying postrheumatic heart cases.

## Air Disinfection Reduces Bacteria, Not Illness

Even children who live in isolated rural areas and spend most of their day at school experience sufficient extracurricular contacts with bacteria and viruses to outweigh any benefit from a substantial bacterial count reduction in the air of their schoolrooms and school buses, according to the results of a 9-year air disinfection study of 4 schools in upstate New York.

The report, fourth in a series, is a résumé of bacteriological investi-

gation since 1945, two members of the New York State Department of Health reported. They are F. Wellington Gilcreas, assistant director in charge of laboratories for sanitary and analytical chemistry, and Hazel R. Read, division of laboratories and research.

Comparative studies of treated rooms and untreated control areas, they said, show that both ultraviolet light and triethylene glycol vapor reduce the number of bacteria in schoolrooms, but that the reduction has no significant effect on viruses and the incidence of measles, mumps, chickenpox, or on respiratory illness. The same results were obtained when triethylene glycol treatment was applied to school buses where 60 to 100 percent of the children were in close daily contact. No significant change in the day-to-day absentee rates resulted, they reported.

### *Contrast Shown*

Gilcreas and Read said that irradiation of rooms by ultraviolet lamps resulted in decreases of 37 percent in the total bacteria per cubic foot, 39 percent in bacteria settling per square foot per minute, and 44 percent in streptococci.

Glycol vapor, said Gilcreas and Read, was carried through the rooms with air circulated by school ventilating systems. This method achieved reductions of 60 percent in the total bacteria per cubic foot, 55 percent in the bacteria settling per square foot per minute, and only 11 percent in streptococci.

Under the conditions of their study, glycol vapor appeared to produce high reduction in the number of miscellaneous bacteria but was not as effective against streptococci as ultraviolet light.

They concluded that the hours away from school and the chance for contact transmittal of viruses and bacteria in the total environmental situation play such an important role that neither ultraviolet light nor glycol vapor can effectively reduce illness.

## Add Sanitation Services At Minnesota University

The environmental sanitation program of the University of Minnesota student health service functions just like a sanitation division in a local health department. This unusual student health service has been designated a local health unit by the Minnesota State Board of Health, according to Richard G. Bond, M.S., M.P.H., associate professor of the university's school of public health.

The majority of college health programs do not assume responsibility for standards of sanitation, Bond pointed out. Such programs are frequently concerned only with food services, student dwellings, garbage disposal, and the like.

Continuing his analogy, Bond, who as public health engineer heads the university's sanitation staff, said:

Minnesota's nearly 30,000 students, 3 campuses, 8,000-acre research center, 2 villages of temporary housing, airport, and other facilities make the university comparable to an average community, but with accentuated problems. These reasons and the university's academic and research activities give unusual scope to the environmental health program.

Close cooperation is maintained with other programs of the student health service and with all operating units of the university. For example, arrangements have been made so that waste lines carrying potentially hazardous wastes are tagged and plumbers are instructed not to initiate repairs without first contacting the health service.

The program expanded after World War II, when a sanitary code was adopted. The program includes the usual activities of water supply sanitation, waste disposal, plumbing, housing, food and milk sanitation, insect and rodent control, plus some very specialized areas, namely—radiological safety, industrial hygiene, and general safety. To show why these safety programs have been added, Bond cited facts:

More than 20 different university departments actively engaged in radioisotope research make area and personnel monitoring and environmental control a necessity.

The university employs a labor force of approximately 4,500 and more than 3,000 faculty members. In addition to the student body, these persons are all exposed to industrial hazards, many of which are magnified in the laboratories.

Nineteen percent of the injuries reported take place in the students' residences. Many of these can be prevented by a safety program attacking the hazards to which the students are exposed.

Other factors which increase the variety of the program, he noted, are the presence of a large medical center, the necessity for special preemployment medical examinations and annual rechecks for all food service workers, the inclusion of programs of preventive medicine, and even the problem of stream pollution.

## Nurse Home Visits Boost Corrective Action Rate

New procedures in the followup of school health examinations increased by one-third the percentage of children taken to a physician for corrective action, announced William G. Mather, Ph.D., Lauris B. Whitman, Ph.D., A'Delbert P. Samson, Ph.D., and Mary E. Ayers.

Dr. Mather is professor of rural sociology, Pennsylvania State University; Dr. Whitman is director of field research, National Council of Churches; Dr. Samson is assistant professor of rural sociology, Montana State College; and Miss Ayers is a research associate, Pennsylvania Department of Health.

In 15 Pennsylvania schools using the new procedures, they reported, the corrective action rate for medical defects was 60.7 percent, whereas in 5 schools not using the procedures, the rate was 45.6 percent.

A new record card that shows at a glance the progress made and the work done by the school nurse toward securing corrective action was the basic tool in the experiment, Mather and his associates specified. By means of colored tabs across the top edge, the card shows whether or not a defect (medical or dental) exists, the number of times the school nurse has contacted the family, and whether or not the contact has resulted in corrective action.

Effects of the new procedures were determined through interviews with families of the children, they noted. Interviewing was done by public health nurses 75 to 90 days after the school health examinations. It covered 97 percent of 484 children having medical defects and 96 percent of 1,117 having dental defects.

The corrective action rate for dental defects, they said, was apparently not influenced by the new procedures. They reported rates of 59 and 60 percent, respectively, for the experimental and control schools, from which fact they concluded that the problem of dental corrective action is very different from that of medical corrective action.

### *Other Significant Findings*

Concerning the value of school health examinations, the study revealed the following:

1. For 46 percent of the children with medical defects and for 68 percent of the children with dental defects, the parents already knew of the defects before the school examination.

2. Of every 10 children given a medical examination, only 0.7 of a child whose parents had not known of the defect before the examination was taken to a physician.

3. Of every 10 children given a dental examination, 1.2 children whose parents had not known of the defect before the examination was taken to a dentist.

Mather and his associates tentatively concluded that the present return from routine school health examinations is not satisfactory for the time and money spent and that the examination itself should be made more of a learning experience for both pupil and parent. They pointed out, however, that although the schools were carefully selected, they would not claim the study results to be typical of conditions in Pennsylvania.

### *Socioeconomic Factors*

Also investigated was the relation of specific socioeconomic factors to taking corrective action for medical and dental defects. On the basis of the data obtained, they stated:

". . . the chances of a child's receiving corrective action . . . are best if the parents know about the defects before the examination, if the father has a college education, if the residence of the family is urban . . . if the income of the family is $4,000 or more a year, if the parents are relatively active . . . in school affairs . . . and if the family consists of only 1 or 2 children below the age of 18 years."

# Mental Health Studies . . .

*Data from cohort studies on first admissions to a mental hospital are interpreted and show areas of needed mental health research. The emotional tensions for which classroom teachers and situations are responsible are discussed. A plea is made for school health workers and classroom teachers to work together as an example of good mental practice to their students. Evidence is presented that one-third of the adult population is responsible for a major part of illness among adults.*

## Finds One-third of Group Have Most Illnesses

Supporting evidence for the thesis that a small proportion of the adult population is responsible for a large part of all the illness among adults was presented by Lawrence E. Hinkle, Jr., M.D., and Norman Plummer, M.D., both assistant professors of clinical medicine at Cornell University Medical College.

They also found in the "ill" group a general susceptibility to all types of illness and accidents in contrast to the well-known phenomenon of specific susceptibility to certain forms of illness.

Their conclusions are based on the study of two homogeneous groups of industrial workers—1,237 women and 1,527 men—in a metropolitan telephone company. The women were telephone operators and the men skilled craftsmen.

In addition to sex, occupation, and place of work, the members of each group were similar in age, cultural background, socioeconomic status, area of domicile, physical condition when first observed, nutrition, and environmental safety, sanitation, and general opportunity for exposure to infection. Each member of the groups had been continuously observed during his period of employment, some for more than 35 years, they reported.

### *The Ill One-third*

Hinkle and Plummer found that about one-third of each group accounted for more than three-fourths of the episodes of illness and four-fifths of the days of disability at-

tributable to the entire group. This finding, they said, confirms the results of other sickness studies of industrial groups.

Frequent minor illnesses, interspersed with major episodes, was the consistent sickness pattern for the "ill" one-third in each group, they said. This third, they reported, also had a disproportionate number of accidents, both major and minor.

They found that the many minor illnesses were scattered throughout many organ systems. The major illnesses were also in several organ systems, usually in those showing the most frequent minor disturbances.

The individuals who had the greatest number of bodily illnesses and accidents also had the greatest number of disorders of feeling state, thought, and behavior, they reported.

By contrast, they said, another one-third of each group had less than 5 percent either of illness episodes or days of disability. Members of this "well" group had a few scattered minor illnesses in several organ systems, and major illnesses after a long period of well-being were the exception rather than the rule.

### *The Stress Factor*

Pointing out that the data lend no support to the concept that one inferior organ system was the main cause of the ill health of the frequently sick persons, Hinkle and Plummer suggested that the persons in the "ill" group were exhibiting a disturbance of function of the whole organism and that each illness represented an isolated manifestation of a total and continuing pattern of reaction.

Good or poor health, they stated, was most clearly correlated with the individual's relation to his psychosocial environment in adult life. All of the ill men and women studied medically, they found, had difficulty in meeting the demands of their special life situation, and all of the well people had adaptive capacities uniquely suited to their life situation.

They observed that a number of the "ill" persons who had been healthy in childhood and had grown up in a benign environment began to develop illnesses when they were inadvertently precipitated into stress producing life situations that were not of their own making.

These observations suggest, according to Hinkle and Plummer, efforts directed at the study of the host may be as rewarding as past studies directed at disease syndromes.

## Mental Health Is Called Keystone of Education

Mental health is that quality which makes the acquirement and use of education possible, declared Dana L. Farnsworth, M.D., professor of hygiene, Harvard University, in a discussion centering around the opportunities for the school health worker or physician to promote mental health.

If it is assumed that education includes intellectual, emotional, social, and spiritual components and that it is the forerunner of wisdom, mental health is a keystone in the structure of education, Farnsworth stated. He defined mental health as "that state of mind in which one is not only free to go about the business of living but actually does so with zest and satisfaction."

Mental health in the schools, he declared, should be thought of in terms of the central purpose for which schools exist, that is, to enable pupils to make optimum use of the qualities, actual and potential, they possess. Accordingly, mental health is a matter of morale, of honesty, of concern with prejudice, discrimination, cheating, fanaticism, hatred, and how teachers and pupils think of one another.

Farnsworth suggested that instead of looking for formulas for the proper rearing or education of children, one might more profitably think in terms of attitudes and inner qualities. The really important matters, he said, are habits of thoughtfulness, of thinking how it must appear to the other person, of awareness of the sensitivity of others, and of a general respect for people.

Training in feeling is fully as essential for the truly educated person as training of the intellect, he maintained, listing the following items which should be considered in the education process: the capacity to give and receive affection, the ability to show anger and to tolerate it in others, the recognition of the presence of strong instinctive reactions such as pride, jealousy, and fear.

### *The School Health Worker*

Mental health is everyone's business, Farnsworth said, but the school health worker and the teacher play especially important parts in the building of mental health, since they see and work with the child while fundamental attitudes toward life are still capable of betterment. They can also work with parents in a constructive direction, he added.

The important qualities needed by the school health worker and the teacher are an awareness of the need for and scope of mental health and the will to do something about it, he remarked.

It is the duty and the opportunity of the school health worker, he continued, to collect and assimilate knowledge gained from the study and treatment of the disturbed and unhappy youngster and to transmit that knowledge in the form of general principles to the classroom teacher. The teacher, on the other hand, sends to the health specialists a constant stream of information about his views of the school's educative process.

This process of working together and learning from one another helps to promote mental health in the school because it enables pupils to see good mental health in action, he explained. He pointed out that students learn infinitely more from what they observe in their teacher's behavior than from what they are told.

## Mental Hospital Studies Pinpoint Research Need

Areas for needed basic research in mental illness have been sharply delineated as a result of the studies by the Warren State Hospital, Warren, Pa., and the National Institute of Mental Health, Public Health Service. For example, what happens to the discharged mental hospital patient is virtually an unexplored field.

Reporting for the hospital were Superintendent Robert H. Israel, M.D., and Nelson A. Johnson, M.S.W., director of social service. The Public Health Service was represented by two members of the institute: Morton Kramer, D.Sc., chief, Biometrics Branch, and Hyman Goldstein, Ph.D., chief, Current Reports Section, Biometrics Branch.

Their joint report concentrated on the trend in probabilities of separation from the Warren State Hospital—either alive or dead within specified time periods following first admission—for patients of specific age, sex, and diagnosis. Admissions to the hospital were analyzed on a cohort basis according to traditional life table methods.

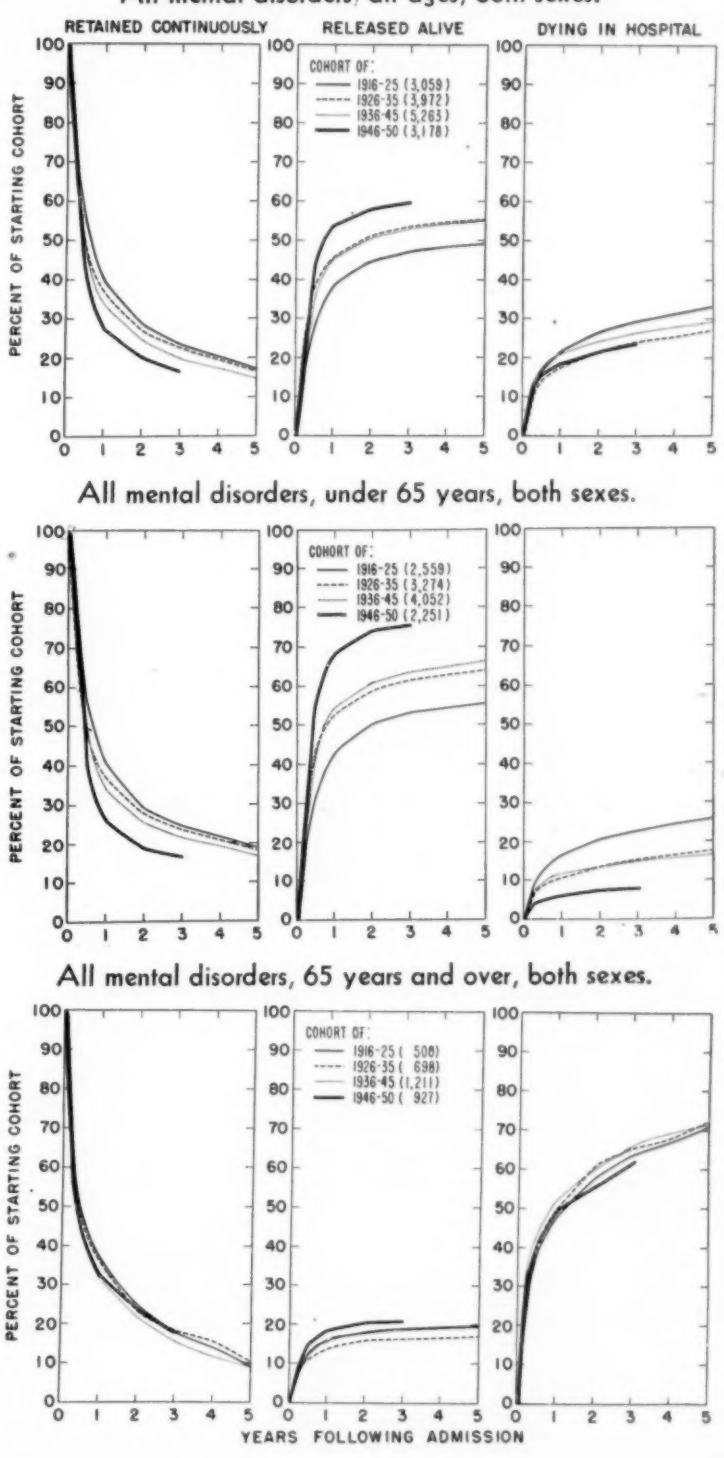
### *The Cohort Studies*

Persons admitted to a hospital for the first time, suffering from functional and syphilitic psychoses, now have increased chances of being returned to the community and decreased chances of dying in the hospital, the authors reported.

"Such facts are quite important in getting community acceptance of the mental hospital as an active, dynamic, medical facility, and in doing away with the idea that once a patient is committed he is lost to his family and to society forever," they pointed out. Among other purposes, the cohort studies were planned to provide historical data against which current mental hospital practices can be evaluated.

Warren State Hospital has abstracted data on first admissions since 1913. Because it offered a more

**Percentage of first admissions retained in Warren State Hospital (Warren, Pa.), released alive, and dead within specified periods following admission, 1916–50.**



complete picture of admissions than did other mental hospitals, it was chosen for study. The periods 1916–25, 1926–35, 1936–45, and 1946–50 were compared because they coincided with events in the history of the hospital that might have had major significance in the treatment of patients. Findings were based on a study of the rates of release alive and of death in the hospital for a total of 15,472 men and women.

### *The Chances of Release*

Some of the facts developed by the studies and the questions they lead to are:

Of patients admitted in the period 1946–50, more were released alive within 1 year following admission than were released alive within 5 years of the patients admitted in the period 1916–25. In none of the periods studied was the proportion of patients released within 5 years after admission less than 50 percent, a much higher proportion than was expected.

The youngest patients, 15–34 years, have extremely high probabilities of release alive. Patients 75 and over have a very small chance of ever leaving the hospital alive.

Between 1916 and 1950, the first admission rate increased in all age groups, and particularly for the age group 65 and over. It increased 126 percent for the age group 75 and over.

*Does this mean a true increase in the incidence of mental disorder in the northwestern Pennsylvania area served by Warren State, or is it merely an increased use of expanding facilities?*

The probability of release in the first year following admission for patients with functional psychoses in the period 1946–50 was considerably in excess of what it was for patients admitted in each of the earlier periods.

*Does this mean that the various therapies used in increasing volume—electroconvulsive therapy, insulin, group psychotherapy, and occupational therapy — have been responsible for this increase in release rates, or have other factors been responsible?*

Patients with senile and cerebral arteriosclerotic psychoses have very small probabilities of being returned to the community alive. Their death rates, particularly in the first few weeks and months following admission, are exceedingly high.

*What are the social, economic, and familial factors responsible for bringing a very high proportion of moribund patients into the hospital?*

Functional psychotics, as well as other categories of patients not released in the first year of hospitalization, experience considerably reduced probabilities of release in the second and subsequent years of hospitalization. Also, patients admitted during 1946–50, who have attained their second and third years of hospital life, have approximately the same chances of being released in the following year as had similar groups of patients in the earlier cohorts of admission.

*What are the etiological and other factors responsible for long-term hospitalization? What treatment methods can be developed to make it possible to return more of these individuals to the community? What can be done to improve the lot of the patient who cannot be returned to society?*

## Teacher Can Aid Child To Grow in Own Way

*"Let me grow as I be,*
*And try to understand why I want to grow like me;*
*Not like my Mom wants me to be,*
*Nor like my Dad hopes I'll be,*
*Or my teacher thinks I should be.*
*Please try to understand and help me to grow*
*Just like me."*

This bit of verse, Helen T. Watson, R.N., said, expresses the kind of classroom freedom which has tremendous implication for schools and the mental health of children. Children need teachers who enjoy teaching and believe in the ability of children and adults to learn, develop, change, and grow, each in his own way. They need teachers who understand teaching, she said.

Watson, a consultant for school health services, Connecticut State Department of Education, emphasized the need for an atmosphere in the classroom which stimulates the child to grow and develop in accordance with his own capabilities and without the fear of unfavorable comparisons with his classmates.

### *For Those Who Teach*

Children need teachers who find ways of enriching their own personal lives, who are adequately prepared and willing to continue to study that they may more fully understand children who appreciate parents and seek opportunities for working with them, Watson stressed.

The personality of the understanding teacher calls for a healthy attitude toward differences in culture, racial and ethnic patterns of behavior, and the influence of social and economic status on behavior. Teachers and other school personnel must become familiar with differences in values and purposes of children in a multigroup society, she continued.

Children need educators who promote the kind of "atmosphere which permits flexibility whether it be in planning the curriculum, deciding on disciplinary measures, or establishing personnel policies," she said. This permissiveness can be successful only where there is relaxed, easy, interpersonal relationships between teacher and school administrator, teacher and teacher, teacher and pupil, and teacher and parent.

### *Classroom Tensions*

Educational leaders have made it clear that teachers who are unaware of what the lives of the children in their classrooms are like may unintentionally create and foster feelings of inadequacy and tension, Watson stated.

One educational practice that has stimulated such reaction is a system of grading scholastic achievement which is based on comparing the educational progress of one child with that of others in his class. Too often a child can construe this as failure and subsequently interpret it as punishment.

Indiscriminate isolation, as a punishment, may serve the teacher, she said, but not the child who interprets it as a point for being docile and submissive in order to be successful, Watson stated. Equally strong in their lasting influence on the child are the "constant nagging pressures" which stem from frequent experiences of hostility communicated by teachers and parents or from the failure of adults to accept normal childlike behavior.

"It should be recognized that growth takes place slowly and that it may take the guidance and encouragement of several teachers through several years and grades to produce behavior changes in a child," Watson continued.

Not to be discarded are some very basic principles, which, when applied, can make positive contributions to the mental health of children. As examples of these precepts for teachers, she listed and discussed the following: All behavior is caused; the human personality grows in the direction of the best adjustment of which it is capable; the ability to face reality even though unpleasant must be encouraged; people face difficult situations with fight or by flight; it is neither necessary nor desirable to be too serious about teaching and guiding children.

# Radiological Health . . .

*Problems of occupational and coincident radiation exposure can be dealt with cooperatively by health, legal, and industrial personnel. Training veterinary inspection personnel to evaluate radiation problems in food and food animals will reduce economic and dietary loss from food wastage.*

## New Jersey Anticipates New Nuclear Industry

New Jersey's fundamental approach to the problem of radiation exposure is occupational, specified Daniel Bergsma, M.D., M.P.H., commissioner of health, New Jersey State Department of Health.

Extension of the program to provide for protection of the general public, however, has followed naturally and necessarily, he said. The use of sources of ionizing radiation is essentially occupational, but the coincident exposures of the general public must also be considered, he maintained.

Citing the Atomic Energy Act of 1954 and the words of President Eisenhower concerning it, Bergsma predicted the appearance of new producers of nuclear energy within a relatively short time. This act opens the door, for the first time, for development of a private atomic power industry. He urged State and local health agencies to prepare, as soon as is feasible, to answer the many questions that will result from expansion of the nuclear industry.

It has been demonstrated, he pointed out, that public health engineers, industrial hygienists, and public health physicians and nurses are able to adapt themselves to the new science of radiological health. There should be no hesitation in asking such staff members to prepare themselves to understand and apply radiological health principles, he declared.

### *Requisites for Success*

On the basis of the New Jersey State Health Department's experience in developing a radiological health program, Bergsma said the following are essential for the success of such a program:

1. Training for field and office personnel.
2. Supportive legislation, in order to define the scope of authority to recommend radiological health controls wherever necessary.
3. Preparation of a concise declaration outlining proposed activities.
4. Ability to impart authoritative radiological health information and specialized advice to all interested parties.

### *Remaining Task*

Thinking in terms of public health administration, public health practice, and public health education, Bergsma said a tremendous task remains to be done. He listed the following objectives for the establishment of standards:

1. Administrative standards: To define in detail the extent to which public health administration of radiological health controls is desirable and feasible.
2. Educational standards: To suggest methods and provide information concerning inservice training in radiological health for public health and allied professional health personnel.
3. Regulatory standards: To establish methods of contacts and provide information for self-regulation by qualified groups or professions.

In Bergsma's opinion, a new governmental control agency is not needed to deal with the problems of radiation exposure. He believes the problems can be met by presently employed personnel. It may be, he remarked, that many of the problems cannot now be resolved by public

health personnel alone, but they will be solved by reference to other health, legal, and industrial problems with the assistance and support of respective experts in these fields.

### Radiation Effect on Food Concerns Veterinarian

Radioactive contamination of the environment is a potential threat to man not only directly but also through its effects on the animal population, Maj. U. S. Grant Kuhn III, VC, USAF, indicated in remarks on radiation hazards to the Nation's food supply.

Major Kuhn is veterinary officer, Atomic Energy Commission, Oak Ridge, Tenn.

Concerning ways in which animals might be exposed to radioactive elements, Kuhn said that fallout, or radioactive dust, from a nuclear detonation may settle on herbage which is consumed by domestic animals, or this fallout may enter the food supply through the soil.

Pointing out that food wastage resulting from hysteria and misinformation is just as serious an economic and dietary loss as that resulting from unwholesomeness, he reported that a training program for veterinary officers of the Army and Air Force has been inaugurated to prepare them to evaluate radiation problems concerning food and food animals.

It is hoped, he said, that by training reserve officers and veterinary inspection personnel engaged in other public health organizational activities information may be eventually disseminated throughout that portion of the veterinary profession upon which the public depends for certification of a wholesome food supply.

## Control of Air Contaminants . . .

*A nationwide air sampling and evaluation study, measurement and reduction of odor, evaluation of bacterial air samplers, and toxic pollutants are among the air pollution subjects covered in this section.*

### Study Prolonged Exposure To Air Contaminants

Despite great advances made in the last 5 years, much remains to be studied toward elucidating the causes of acute symptoms leading to fatalities in air pollution disasters, according to Morris Katz, Ph.D., chairman, Canadian section, Technical Advisory Board on Air Pollution, Defense Research Chemical Laboratory, Ottawa, Canada.

Necessary for a sound approach to the problem of chronic injury are data of fundamental environmental and meterological observations on a continuous basis concurrently with measurements of ill health in properly established pollution and control areas, he asserted. Meteorological investigations needed include measurements of wind speed and direction, lapse rate and turbulence, temperature, humidity, precipitation, visibility, and solar illumination.

#### *The Detroit Study*

The Detroit-Windsor study is aimed at determining the effects of prolonged exposure to atmospheric contaminants of a highly industrialized region, he related. The approach is not rigid and methods will be improved through experience, he commented.

Routine measurements on a continuous basis provide information on dustfall, airborne particulate matter, and sulfur dioxide. Continuous records have also been obtained of visibility, extent of solar illumination, soiling index of the air by fine aerosols, and meteorological variables already mentioned, he reported.

Through environmental sampling techniques, areas of high and low pollution were selected and sampling stations were established in 28 census tracts in Detroit, he reported. The same procedure was followed in Windsor and 25 sampling stations were set up. On the basis of observations by these sampling stations, areas highly polluted and areas with low pollution, containing well-defined population groups and matched socioeconomically as far as possible, were selected for morbidity study, he reported.

The initial objective was to obtain information on the incidence of symptoms and illness among those in the various study areas, Katz related. This health study was started late in the summer of 1953, and the health records for the first year are now being assessed by a group of experts, he said.

#### *Chronic Effects*

The atmosphere of industrial communities contains a great number and variety of organic and inorganic contaminants, he said. Complicating the situation are reactions of a photochemical and catalytic nature which occur between gases and vapors or between gases and particulate matter after liberation in the air, he asserted.

The inorganic fraction of the complex matter suspended in air includes a considerable number of metallic elements. The most abundant are silicon, calcium, aluminum, iron, magnesium, lead, and manganese.

Small amounts of zinc, copper, titanium, tin, vanadium, cadmium, and beryllium are also present. These elements represent about 10 to 20 percent of the total weight of the airborne particulates, he pointed out. A number of industrialized cities in the United States and the Windsor-Detroit area show only minor variations in the percentage composition, Katz said.

The composition of the organic contaminants is still largely unknown. It is probable that the organic fraction in air pollution is of greater importance in the study of chronic effects on health, Katz stated, than the inorganic material under normal circumstances in an industrial area. When the level of contaminants increases under adverse weather conditions, the concentration of the organic portion of airborne particulates tends to increase much more than the inorganic fraction.

*Causes and Symptoms*

In the Donora case, U. S. Public Health Service studies concluded that no single polluting agent was present in sufficient quantity to account for the acute injury to the population's health, he said. Responsibility was placed on a synergistic factor involving some combination of contaminants.

The general and special physiological effects of the Donora and Meuse valley incidents are similar, he declared. The symptoms and signs were irritation of the eyes and respiratory tract followed by coughing, nausea, vomiting, headache, and dyspnea, he reported, and added that there were also varying stages of circulatory collapse, cardiac decompensation, and pulmonary edema.

Death was due predominantly to acute cardiac failure with or without obvious pathology, Katz said. The elderly, those with respiratory diseases, cardiovascular diseases, or asthmatics were the majority of victims.

## Tells How to Evaluate Bacterial Air Samplers

In recognition of the need for uniformity in the evaluation of bacterial air samplers, William Lester, Jr., M.D., Chicago University associate professor of medicine, presented an outline of tentative methods for determining their efficiency. He remarked that no foolproof technique exists. Only by the laborious checking of each variable can valid results be obtained, he said.

Essential to Lester's outline is the understanding of the meanings of collection efficiency and retention efficiency, which he explained. Both efficiencies, he said, should be determined for each sampler studied. He outlined the following procedures as necessary to the detailed evaluation of the physical and biological performance of a specific sampler. Once the procedures have been found valid, he added, a short cut becomes evident.

*Suggested Outline*

1. In order to obtain reproducibility and uniformity of particle size distribution as a basic prerequisite for any comparative analysis of sampler performance, it is necessary to control these parameters: temperature, relative humidity, conditions of atomization, chemical constituents used in the culture media and atomizing vehicle, rates of flow and sampling, position and site of sampling, and also the metabolic and functional status of the biological agents used.

2. It is difficult to obtain satisfactory control of all these factors in a static chamber because of the interference of various local variables; therefore, to obviate these difficulties, a dynamic chamber should be used in conjunction with a nonreflux type of constant delivery atomizer, in which the aerosol is generated and evacuated at a uniform rate.

3. Collection and retention efficiencies should be determined upon a quantitative basis using an inert, nonvolatile, stable aerosol. They should be determined for the various rates of flow and over different ranges of particle size so that the specific physical efficiencies of the sampler can be fully characterized.

4. Whatever tracer technique used, whether the aerosol contains water or oil soluble dyes, specific chemical tracers, or radioactive agents, it is important that the technique be capable of accurate quantitative measurement in low concentrations and that the substances used are uniformly distributed throughout all the particles contained in the aerosol.

5. The determinations of efficiency should be made upon both wet and dry aerosols of various (suggested) particle size ranges, from the largest size capable of aerial dispersion down to the minimum diameter of particles capable of containing a bacterial cell.

6. Studies should be made of the collection and retention efficiencies of a specific air sampler for biological aerosols made up of viable bacterial cells because many factors present in atomization and sampling can influence the survival of bacterial cells.

7. The basic comparative evaluation of bacterial air samplers must be made upon aerosols containing only micro-organisms of species normally dispersed into the air by human beings. All cultures should be carefully standardized as to their state of growth.

8. The evaluation studies with bacterial aerosols should follow the same general procedure advised for the determination of physical collection and retention efficiencies but using bacterial counts instead of colorimetric or gravimetric determinations.

9. Because of the profound influence of relative humidity upon the size characteristics and survival of bacterial aerosols, it is worth while to correlate the efficiency and performance of any given sampler with various (suggested) relative humidities.

10. The same ranges of particle size distribution advised for the inert

clouds should be studied for use with the bacterial aerosols.

## Engineers Measure Odor, Now Reduce Its Effect

An industrial plant's air pollution control program using $2.8 million worth of equipment and requiring $700,000 annually to operate was described by Virgil E. Gex, in charge of pollution control engineering, Procter and Gamble Company, Cincinnati, Ohio.

The cost breakdown, he reported, shows that $1.4 million was spent on cyclones and filters for process exhausts. The $250,000 annual operation cost, he said, is believed to be exceeded by the value of the material recovered.

Cyclones and filters for room dust control systems cost $400,000 to install and $80,000 per year to operate, he said, and added that recovery from such systems is not believed to pay its operating expenses. One million dollars has been spent on equipment to reduce, eliminate, or dispel odors, Gex reported. The operating costs for this equipment runs over $400,000 per year, he commented, and there is no product recovery.

### *Odor Research*

Work on odor control began 9 years ago, he said. The first problem was a lack of any quantitative concept of odor. The conventional approach had several weaknesses and a method of measuring odor directly was developed.

He defined an odor unit as the amount of odor necessary to contaminate 1 cubic foot of air to the odor threshold—a level barely detectable by the sense of smell.

### *Osmo*

To find an odor unit, a sampling device, nicknamed the "Osmo," was developed. It uses a continuous flow of 10–20 c.f.m. of odor-free reference air into which increasing amounts of odorous sample is introduced until odor is found in the exit mixture, Gex explained. This gives a ratio upon which to base measurements in odor units per cubic foot, he added.

Once emission rates for various discharges in order units per minute can be calculated and compared on a common basis, Gex declared, odor reduction efforts can be more easily concentrated on big discharges first.

Odor emission rates can also be used to calculate how high a stack should be to keep the maximum ground concentration below one odor unit per cubic foot, he pointed out.

Osmo has made it possible to use lower and more efficient temperatures in several furnaces used to deodorize process exhausts, he added, and thus to save $50,000 annually, on fuel bills.

### *Odor Control*

Four methods employed and examples of their application to control odor pollution, Gex related, include stack dispersal and:

*Operating techniques.* Reduction of odor discharge by changed operating technique involves little investment. Conventionally, cleaning tank cars involved liberal steaming. The excess steam, escaping from the tank car carried a good deal of rancid fat odors. A satisfactory steaming procedure was worked out, eliminating the odor nuisance.

*Process change.* One batch operation process discharged odors during one part of the batch cycle. Although more expensive, the processing was converted to a continuous operation to reduce the total odor discharge. Also, changing from line steam to recirculation jet in the acidulation of soap stocks reduced odor discharge to $\frac{1}{500}$ of its former value.

*Control equipment.* A variety of equipment is used including spray condensers, enclosed vent systems, packed scrubbers, Venturi scrubbers, odor furnaces, activated carbon filters, centrifugal separators, and air filters.

## Nonspecific Irritants in Air Implicated in Smog Studies

Citing "unquestionable evidence that air pollution can contribute to health impairment," Norton Nelson, Ph.D., of the Post-Graduate Medical School, New York University-Bellevue Medical Center, concluded that nonspecific irritants acting additively may be one of the most important toxic effects of air pollutants for the respiratory system. Dr. Nelson is professor of industrial medicine and director of the school's Institute of Industrial Medicine.

On the basis of available data concerning effects of respiratory irritants, Nelson advocated further study of the following points:

1. The probability that a person already under stress may suffer significantly from a level of an irritant innocuous to a healthy person, and, similarly, the possibility of enhanced susceptibility of the very young and the very old.

2. The possibility that the physical state of pollutants influences their effects on the respiratory system.

3. The possibility that irritants other than those conventionally accepted as important may contribute to the problem.

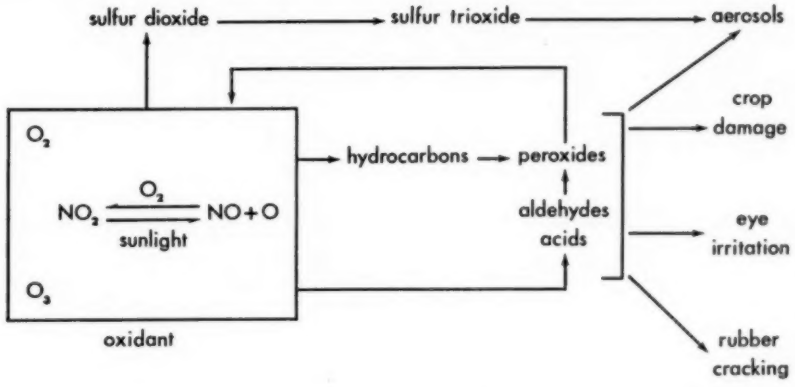
### *Donora and London*

The difficulties observed during the Donora, Pa., smog of 1948 and the London fog of 1952 seem to be attributable to the fact that a nonspecific respiratory irritant or group of irritants impose an additional stress on an already overburdened respiratory or cardiac system, Nelson specified.

Investigation of the Donora incident has shown, Nelson said, that a real and systematic increase in "complaints" occurred and that they occurred with greater frequency where preexisting disorders were present.

Nelson noted also that there was unquestionably an association between the increase in the concentration of sulfur dioxide in the atmos-

**Schematic presentation of the mechanism suggested by Haagen-Smit to explain the observed effects of smog in Los Angeles.**




phere and the increase in deaths during the London fog. Nelson felt, however, that other irritants may have been important.

### *Functional Changes*

That air contaminants may produce functional changes, as contrasted with organic changes, has been suggested by studies on the effects of inhaling sulfur dioxide and sulfuric acid mists, Nelson stated. Amdur and associates showed that reflex changes in pulse rate, tidal volume, and respiration rate occur with the inhalation of these substances at levels well below the detection threshold.

Since the functional operation of an organ may be distorted or modified by a toxin without leaving any evidence of trauma if the insult is survived, Nelson advocated a search for such functional changes in relation to air pollutants.

Another significant point demonstrated by these and other studies is that sulfur in the form of sulfuric acid appears to be as much as five times as toxic as sulfur in the form of sulfur dioxide, Nelson stated. This may arise from the fact that sulfuric acid is a stronger acid, but Nelson considered equally or even more important the fact that sulfuric acid exists in the form of particles, whereas sulfur dioxide exists in the form of a gas.

Evidence suggests that the depth of penetration in the lungs of water-soluble gases may be increased when they exist in the form of very small particles, he said, theorizing that, if this be so, irritants borne by small particles may reach a more susceptible tissue and therefore produce increased toxicity.

### *Lung Cancer and Air Pollution*

Nelson considered the available data bearing on a relationship between general air pollutants and lung cancer inadequate as a basis for any definite conclusions. He summarized the present knowledge of this subject as follows:

1. There is probably a higher incidence of lung cancer in urban than in rural groups.

2. Urban and industrial centers have higher concentrations of known carcinogens than areas with less air pollution.

## Discuss Increased Accent On Air Pollution Studies

Airborne effluvia resulting from man's own activities have emerged lately as nuisances, causes of severe economic loss, contributors to discomfort, and occasionally, as killers, Leslie A. Chambers, Ph.D., Vernon G. MacKenzie, B.S., and Milton J. Foter, Ph.D., reported.

Dr. Chambers and Dr. Foter are with the Robert A. Taft Sanitary Engineering Center, and Mr. MacKenzie is with the Division of Sanitary Engineering Services, Public Health Service.

Air pollution is a problem of such magnitude that no one locality, no national center, can be expected to make significant progress without coordination and collaboration with other groups, they stated.

Irritating and damaging smogs, such as the one at Donora, Pa., have made clear that smoke abatement is only a facet of the problem, Chambers and his associates said. Recent technical literature stresses the complexities of air sampling, the identification and control of specific pollutants, the chemical reactions in the air, and the economic and health effects of airborne substances.

Air pollution episodes less severe than that in London in 1952 occur in many places. A mechanism for correlation of vital statistics with pollution variables is necessary, Chambers and his associates said.

Prior to 1954 the Sanitary Engineering Center initiated three exploratory projects: (1) the nationwide sampling program seeking knowledge of the amounts of particulate material in the air over a group of arbitrarily selected cities; (2) an attempt at statistical correlation between available mortality data from a large metropolitan area and measured meteorological and pollution data covering the same period of years; and (3) a continuing effort in assembling information concerning local evaluation, investigation, and control of air pollution and its problems.

Now five types of activities are being started:

1. Expansion of the exploratory sampling network, including more problem areas as well as intensification of study in areas already activated.

2. Immediate initiation of work on the evaluation, and where necessary, the development of sampling equipment and analytical procedures for gases and volatile substances.

3. Study of physiological effects

of air pollutants so that control standards can be established.

4. Extension of the exploratory attempt at correlation between pollution loadings and mortality data to include several other cities.

5. Initiation of a technical study of community control patterns related to the air pollution problem.

The objectives of the last study, Chambers and his co-workers said, will include the determination of necessary survey patterns; procedures for obtaining unified support for programs in regions involving more than one governmental unit; probable legislative requirements and other guideline data.

# Hospitals, Home Care . . .

*Measurement of quality of hospital care, reimbursement problems of regional hospitals, and the advisability of a hospital-operated home care program for special disease conditions are discussed in this section.*

## Approaches to Measuring Hospital Care Quality

Methods of measuring the quality of hospital care were discussed by Mindel C. Sheps, M.D., M.P.H., research associate of the department of biostatistics, Harvard University School of Public Health.

Most of the work done to date has been related to setting minimum or desirable standards for accreditation and in stimulating improvements in hospital care, Sheps stated. The field of program evaluation is just beginning to be explored, she said.

### *Main Approaches*

Sheps described four of the main appraisal techniques that can be used alone or in combination: (1) examination of prerequisites for adequate care, such as minimum or optimum levels of facilities, equipment, professional training, or organization; (2) performance elements, such as autopsy and cesarean rates, or accuracy of diagnostic procedures; (3) results obtained on patients, such as postoperative, puerperal, and neonatal mortality rates, or incidence of postoperative infections; (4) qualitative clinical judgment.

Any of the appraisal indexes and standards used should be clearly defined, based on comparable data, and examined for reliability and validity, Sheps said, adding that statistical controls and analyses should be applied to the clinical appraisals as well.

As one of many examples illustrating the need for study of appraisal indexes and the difficulty of setting valid standards, Sheps cited the use of postoperative death rates as an index to effective care: "Does the death rate within 10 days after major chest surgery really reflect the quality of care? What about the effect of such patient characteristics as diagnosis, complicating illnesses, age, sex, and nutritional status?"

The first three techniques were termed objective indexes that hold considerable promise for the appraisal of hospital care. However, she pointed out, they are not yet the ideal measuring tools. At best, she said, they are indirect and partial indicators of the basically intangible characteristic of patient care.

### *Clinical Judgment*

Clinical evaluations, while less precise, may be more valid since they offer a more direct approach, she said. In this type of appraisal, she explained, qualified consultants appraise hospital records in the various clinical fields, such as medical, surgical, obstetrical, nursing, and social service, and score the performance according to prepared standards.

There are, she said, widely accepted concepts of what is meant by good care, and thus the reliability of qualitative judgment can be tested and subjected to statistical analysis. Sheps stressed the need to obtain the appraisals of several independent judges. "Only through separate evaluations is it possible to assess the consistency of the individual judgments and to arrive at a relatively unbiased estimate," she said.

Sheps pointed out that although any of the four approaches to the quality of hospital care involves comparisons, either indirectly through the use of standards or directly, the basis of comparison is vital in program evaluation.

If a specific procedure has an effect on quality, it must be revealed in differences, she said, adding that to find such differences, the hospital under study must be compared with something—either with other hospitals or with its own earlier performance.

## Lack of Data Complicates Hospital Care Comparison

Because diseases are the same throughout the country, every hospital patient should have the same good care, no matter where he resides nor what hospital he enters, said Paul A. Lembcke, M.D., associate professor of public health administration, Johns Hopkins Uni-

versity School of Hygiene and Public Health.

If a hospital is not equipped with staff and facilities to provide care of good quality for certain diseases or conditions, that hospital should refer such cases to hospitals that are better equipped, Lembcke maintained.

Regional organization of hospitals, he believes, is one important method by which the integration of needs and resources can be accomplished.

Preferring to avoid using different standards for different hospitals, Lembcke recommends the publication of more actual data as essential to measuring the quality of hospital care. He pointed out that conclusions based on studies made in one hospital alone, not related to all hospitals in the community, tended to be erroneous or actually misleading because the patients are a select group and not representative of the general population.

He said data such as those published by the Saskatchewan Hospital Services Plan, the Windsor Medical Services, and the Health Insurance Plan of Greater New York had proved helpful in measuring his own studies in Rochester, Indianapolis, Petersburg, Cooperstown, and other areas.

Lembcke cited the need for figures on excessive surgery and on the incidence of certain diseases as an approach to the use of quantitative methods of measurement. "I know," he said, "this is often a very ticklish subject, studies being made chiefly in hospitals where it is suspected that the quality is not what it should be." But the identity of the hospitals studied need not be made known, he countered.

## Boston Home Care Study Tests Selectivity Benefit

A home care program will be more effective if it serves all types of illness rather than limited disease categories. This conclusion was drawn from the results of a 2-year trial home care program for selected Boston City Hospital cardiac patients.

Reporting the study were Henry J. Bakst, M.D., professor, and Edward F. Marra, M.D., instructor, department of preventive medicine, Boston University School of Medicine.

Under the conditions of the study, 55 persons in the study group and 35 persons in the control group were selected at random from hospital ward cardiac patients. Both groups were discharged home without care by a private physician. The patients were comparable in severity of illness and economic and social status.

Patients in the study group received individual medical care on a 24-hour-a-day, 7-day-week call basis in their homes or, if necessary, in the outpatient department; visiting nursing care; and social services by the hospital medical social worker and community agencies.

Home examinations included electrocardiograms, venipunctures, and thoracenteses. Medical services included dressing of varicose and postphlebitic ulcers, applications of Unnas' paste boot, and, in one instance, placement of improvised drainage tubes.

**Comparison of services for study group and control group in Boston City Hospital home care program**

| Service | Study group (55) | Control group (35) |
|---|---|---|
| Physicians' home visits | 1,515 | |
| Home visits per patient | 27.5 | |
| Outpatient department visits | 80 | 231 |
| Visiting nurse association visits | 1,030 | 393 |
| Visits per patient | 18.7 | 11.2 |
| Percent of patients visited | 58.2 | 31.4 |
| Frequency of visits (weekly) | 2–3 | 1–2 |
| Hospitalization: | | |
| Total days | 857 | 434 |
| Number of admissions | 50 | 39 |
| Admission rate per 1,000 patients | 909 | 1,115 |
| Cardiac hospitalization: | | |
| Total days | 203 | 239 |
| Number of admissions | 10 | 27 |
| Admission rate per 1,000 patients | 182 | 772 |
| Noncardiac hospitalization: | | |
| Total days | 654 | 215 |
| Number of admissions | 40 | 12 |
| Admission rate per 1,000 patients | 727 | 343 |

The control group received medical care in the outpatient department or through emergency home visits that were usually followed by rehospitalization.

### *Range of Illness*

The intensive home care reduced the rate of hospitalization for heart disease, they reported, but it increased materially the hospitalization rate for noncardiac disease. Thus, they said, the total rate of hospitalization in both groups for all causes was essentially comparable.

Readmission to the hospital because of exacerbation of cardiac symptoms occurred more than four times as frequently in the control than in the study group, they explained, but hospital readmission for noncardiac diseases was more than twice as frequent in the study group (see table).

Since the hospitalization costs were about the same for both groups, the home care service for the study group was an additional cost item, they reported. However, they pointed out, the home care service permitted better and more effective med-

ical service and thus isolation of the costs is difficult if not unrealistic.

The amount of associated disease found in the study group indicates that comprehensive medical care programs actually increase the variety of services needed by aged or chronically ill groups, Bakst and Marra observed. The Boston experience, they said, emphasizes the contribution an effectively organized and developed home care program can make through case finding, early diagnosis, and treatment of incipient illness.

Attempts to develop programs for a single disease category are probably unjustified except to form a base for broader and more inclusive services, they concluded.

## Children's Hospitals Face Reimbursement Problems

Under present conditions, the regional hospital assuming responsibilities for the rehabilitation of various childhood disabilities is operating at financial disadvantages, according to Lendon Snedeker, M.D., M.P.H., and Edward S. Lancaster.

Dr. Snedeker is assistant administrator, Children's Medical Center, Boston, and Mr. Lancaster is its comptroller.

Burn cases cost the hospital $31.86 a day, but it is reimbursed $27.03, they said. These patients require an average 105 days of bed care. Daily cost for congenital heart disease patients varied from $31.73 to $50.50, but the reimbursable cost is $26.99, and the ward charge, $17.00. On these youngsters, the hospital loses an average $50–$100, or more. In cases of cleft palate and harelip, the cost situation is more favorable to the hospital.

Reconstructive surgery in such situations has been undertaken with the implicit understanding that the charge per day or per case will considerably exceed the standard reimbursable cost figure, but it is doubtful that the two will ever balance out. Even though it operates at a financial loss, the hospital must live up to its obligations in the fields of service, teaching, and research.

The administrators suggested that regional problems be financed on a regional basis in order to eliminate the dispensing of charity from local funds. One-third to one-half of the rehabilitation cases admitted to Children's Medical Center come from outside the Boston area, yet it, like other large children's hospitals, is the logical reference point for the difficult rehabilitative cases. Repeated spot checks have shown that these children are referred for a wide variety of conditions, most of which cannot be effectively diagnosed or treated in their own communities.

More figures are needed as to the rehabilitation costs for various types of childhood disability, both from the standpoint of the funding agency and of the hospital providing the service, Snedeker and Lancaster said. With this in mind, the medical center has begun to maintain a register of children admitted for such care. Also needed is a thorough case study for the total cost of finding, diagnosing, and adequately treating any particular childhood handicap, they pointed out. Such study ought to ascertain family outlay for private medical care and travel as well as the expenses incurred by the family or any medical agency for special operations, aftercare, and training.

# Nutrition in Institutions . . .

*Food planning in institutions, cooperation between State and local health agencies in providing nutrition services, standards for hospital diets, and food practices in nursing homes are the subjects of this series of papers.*

## Ohio Nutrition Service Aids Local Institutions

Cooperation between State and local agencies can help meet the responsibility for providing nutrition services for institutions, according to Ralph E. Dwork, M.D., M.P.H., acting director of the Ohio Department of Health.

Institutions such as general, tuberculosis, or mental hospitals, children's or nursing homes, and homes for the aged frequently need help with their nutrition problems, Dwork said, pointing out that local health departments cannot always meet this need. State consultation services, he believes, should be made available in many areas of service—in preplanning kitchen layout, in teaching best use of equipment, in menu planning, in food purchasing, in preparation and serving of food, in control of wastes, and in control of costs. The Ohio State Health Department provides these services when the local units cannot or do not provide them, he stated.

The availability of trained personnel has not kept pace with the stepped-up hospital building program in Ohio, Dwork reported. He said that Ohio has directed its building efforts toward the smaller cities and rural areas, its areas of greatest need. This expanding program, still short of the recommended goal of 4.5 beds per 1,000 patients, creates a greater need for dietary personnel.

In Ohio today, 90 general hospitals, 14 tuberculosis hospitals, 19

mental hospitals, 140 children's homes, and over 600 nursing homes and homes for the aged have inadequately trained dietary personnel, Dwork reported. Hospitals in the larger cities, with higher salaries, shorter working hours, and offering better professional associations appear to be more attractive to the trained, Dwork asserted.

Dwork said that inservice training of untrained dietary workers under direction of a trained dietitian is a possible solution to the shortage problem in some cases. Another way out, he said, is joint hiring of a qualified dietitian by several institutions.

### *Exploring New Areas*

The principle of offering service to local health departments and not directly to local communities guides the policy of the Ohio State Health Department, Dwork pointed out, but Ohio entered the field of dietary consultation direct to institutions on the basis that a State health department should explore new areas, whether or not called upon by the local departments to do so. The State, he said, will relinquish this function when the local health departments take over the task. In the meantime, local health departments are helping jointly with training, demonstration, and instruction of individuals or groups of patients, Dwork reported. Food sanitation services, Dwork said, are a local responsibility wherever and whenever possible. When not possible, he implied, it becomes the State's affair.

## Indiana Aids Hospitals In Food Planning

Indiana has been among the first of the States to recognize the importance of nutrition in institutional care, Margaret A. Dunham, M.S., chief nutritionist of the Indiana State Board of Health, reported.

In January 1948 the State board of health employed an institution nutrition consultant to help the 129 general and allied special hospitals, 74 children's institutions and day nurseries, and the 33 county homes for welfare recipients with their dietary and food service problems, Dunham said.

More recently, in July 1943, she reported, the 17 mental and correctional institutions were included in the improved food program when a dietary consultant was added to the staff of the board's newly formed mental health commission.

During the past 6 years, Dunham said, the institution nutrition consultant's work has covered four major areas: surveys to check compliance with the nutrition standards required for annual State licenses; consultant services to individual hospitals; consultation on dietary facilities in new or remodeled hospitals; and group instruction.

The initial survey of the then 124 hospitals revealed that in 63 hospitals, food service was supervised by untrained persons, Dunham reported. Only 52 employed a trained dietitian, and in 9 a home economics graduate was in charge of the dietary staff. Since 56 of these hospitals had 50 beds or less, they obviously could not afford a trained dietitian and needed the consultant's help, she said.

The consultant reported a general lack of understanding by the hospital personnel about the makeup of a nutritious diet, Dunham said. Many hospitals needed help in planning general and modified menus and in improving food service to patients and personnel, food preparation and storage methods, dishwashing procedures, arrangement of kitchen equipment, and economical food purchase, she said.

Surveys of the children's homes revealed that many of them were planning meals more suitable for adults, Dunham said. Meals are often inadequate in quantity for teen-agers. They lacked variety, and combinations were unattractive; suppers often consisted of leftovers from the previous meal.

During the past year, Dunham reported, 26 hospitals requested assistance from the nutrition consultant. In addition to a monthly evaluation of their menus, she has made 4 or 5 visits to the hospitals.

Dunham told of the consultant's work in a 27-bed tuberculosis hospital—a typical example of her assistance.

On her first visit to the hospital in 1949, Dunham said, the consultant found the menus were low in green and leafy vegetables; eggs were served only twice a week, and suppers consisted of food served cold plate style. Menus were planned on a day-to-day basis.

The consultant, she said, has been instrumental in bringing about the following improvements: menus that will more nearly meet the nutritional requirements of tuberculous patients; purchase of milk in individual containers for the patients; installation of new dishwashing equipment; replacement of a wornout, two-compartment sink; and better food-purchasing methods.

Dietary conferences have been held for hospital personnel since 1951, Dunham reported, and a series of 1-day institutes have been organized for matrons, board members, and cooks in the children's homes.

## PHS Studies Standards For Hospital Diets

Nutrition standards provide hospitals with a yardstick with which to measure adequacy of foods, stated James M. Hundley, M.D., chief, Laboratory of Biochemistry and Nutrition, National Institutes of Health, Public Health Service, Bethesda, Md.

They also serve as a baseline for the management and control of food and for the preparation and review of budgetary requests, he continued, and they are particularly useful when a number of hospitals are supervised from a central point.

Hundley suggested, however, that, because of the variation of nutrition-

al needs in different types of institutions, standards should be sufficiently flexible to account for local circumstances. Probably no single nutrition standard can be applicable and valid for all hospitals, he said.

Today's nutrition standards might better be called nutritional goals, Hundley said. The standards recommended are the result of studies made in 1952 and 1953 in five completely different types of Public Health Service hospitals — general medical and surgical, neuropsychiatric, tuberculosis, leprosy, and research.

Modifications of the dietary allowances recommended by the Food and Nutrition Board of the National Research Council for healthy, physically active persons were used as the basis for the nutrition standards in all of the hospitals in the study, Hundley said. The hospital diets were noticeably higher in protein, vitamins, and minerals than the diets recommended by the Food and Nutrition Board.

### *Hospital Standards*

Patients in the general hospitals are usually males who are accustomed to a physically active life and to a relatively high food intake, Hundley said. A large proportion are ambulatory during their entire hospital stay and an appreciable number are nutritionally depleted when admitted. Some modification in favor of protein and vitamin C content was made in these hospitals to account for trauma, surgery, and other hospital factors.

Mental patients frequently eat little or develop bizarre food habits, and it is important that the food served them be high in quality and in nutrient content, Hundley stated. He said that the majority of the patients in neuropsychiatric hospitals are ambulatory, and that many of them work about the hospital station doing heavy farm labor, dairying, and other physical work.

In both the tuberculosis and leprosy hospitals, diets are high in calories, protein, minerals, and vitamins, including vitamin D. Most of the patients in these hospitals are undernourished on admission, and many of them are bedridden for long periods and cannot get out into the sunshine.

The standards for the research hospital—Public Health Service Clinical Center—were set up before the hospital was put into operation, and were based on an average of the nutrition standard set up for general hospitals in this study and on similar standards set up by the Food and Nutrition Board for physically active women, Hundley stated.

### *Standards Practical*

Reports on nutrition in 4 general, 1 tuberculosis, and 1 leprosy hospital indicate that the nutrition standards are practical and that food costs are reasonable, Hundley said. In the 4 general hospitals, standards were met or exceeded as follows: calories, 2 hospitals; protein, vitamin A, riboflavin, and ascorbic acid, all 4; calcium, 2; thiamine, 1; niacin, 1, and iron, 3.

Diets in the tuberculosis and leprosy hospitals met or exceeded the nutrition standard, Hundley said, except that the tuberculosis hospital failed by a very slight margin to meet the calcium standard.

## Nursing Home Nutrition Theory Versus Practice

If the diets for patients in nursing homes are to be adequate in amount and in the essential nutrients, and if the food practices in these homes are to meet good standards, more information is needed on how actual food and nutrition practices compare with good theoretical standards.

Joseph H. Kinneman, M.D., deputy commissioner of health, and Ruth Nelson, R.N., public health consultant for institutions, Nassau County Department of Health, John H. Browe, M.D., director, and Elizabeth Agnew, nutritionist, bureau of nutrition, New York State Department of Health, reported the findings of a cooperative study of 20 licensed nursing homes in Nassau County, N. Y. The study, made in the summer of 1954, agreed completely with the cumulative records maintained by the local health department since 1941.

All homes had a sufficient supply of canned goods to last a week, and 65 percent had adequate supplies for a month; supplies of perishable foods were sufficient in most to last a week.

In most instances, food storage was better than in public eating and drinking places. No dietitian or a person with training in nutrition was employed in any home, and in most places, the cook was given little or no supervision or direction.

The quantity, preparation, and service of food were good. The heartiest meal was served in the middle of the day. Dining rooms or dining areas were seldom used, even when available; tray service was the rule. Regular diets did not always include the "basic 7." Vegetables and fruits, particularly a daily serving of green or yellow vegetables and citrus fruit, were not the rule, but all homes made some provision for special diets.

Water supplies, sewage disposal facilities, dishwashing practices, and food handling techniques were good in all, and these practices were better than those found in commercial eating establishments. The frequency of garbage collection was satisfactory, but garbage storage was not.

### *Suggestions and Recommendations*

Kinneman and his co-workers made these suggestions for changes and improvements in food and nutrition practices:

More use of garnishes to make food attractive in appearance.

A later supper hour—in only 15 percent of homes was there a 10-hour interval between breakfast and supper.

More careful supervision of the cook, and development of menus and standardized recipes subject to approval by a person qualified in the field of nutrition.

Expansion of kitchen space, replacement of old equipment, and addition of mechanical aids to food preparation and to food and utensil care.

Improvement of the physical setup of dining areas and the encouragement of more use of dining room facilities.

More attention to the modification of special diets, according to changes in the clinical condition of the patient.

Finally, Kinneman and his colleagues suggested that a study be made of a comparable group of nursing homes, which have been subject only to accreditation by a State agency, for comparison with the findings of the Nassau County study.

# Immunology . . .

*The avirulent rickettsial strain vaccine used experimentally against epidemic typhus and the live virus vaccine used in the Georgia rabies epidemic in dogs are favorably reported. A properly conducted neutralization test is preferred for the immunological diagnosis of Newcastle disease virus, and a new antityphoid agent offers promise.*

## Newcastle Disease Virus Neutralization Test

In immunological diagnosis of Newcastle disease virus (NDV), a properly conducted neutralization test is the technique of choice in the opinion of Alfred S. Evans, M.D., of the departments of preventive medicine and medical microbiology, University of Wisconsin School of Medicine.

Diagnosis, whenever possible, should rest on isolation of NDV in a laboratory free from possible accidental contamination, he asserted.

An immunological diagnosis should be made carefully and only after nonspecific inhibitors have been eliminated, and the serum has been shown to contain no mumps antibody, he said.

Primarily an acute infectious disease of fowl, Newcastle disease is of importance as a possible human pathogen because of its striking resemblance to the mumps-influenza virus group, he commented. NDV has been established as a cause of acute conjunctivitis in humans, but the relation of the virus to acute hemolytic anemia is not certain.

Laboratory work on analysis of NDV by hemagglutination, complement fixation, and neutralization tests has resulted in confusing and misleading data, he asserted, and it has been difficult to establish the presence of NDV antibody in human serum.

### *Recommended Test*

Evans outlined the procedure for the recommended neutralization test as follows:

Serums were heated at 56° C. for 30 minutes to destroy nonspecific heat-labile component. Undiluted serum was mixed with varying dilutions of virus, since antibody effect is rapidly lost on dilution of serum and passed through embryonated eggs. Death of eggs in 2–6 days was the endpoint.

Experiments were conducted with 26 persons exposed to NDV and 26 controls. Serums from 21 of the 26 exposed individuals neutralized more than 10 $ID_{50}$ doses of NDV as did one serum from the control group, due to a cross reaction with mumps antibody. High neutralizing activity, inhibiting over 10,000 $ID_{50}$, was present in the serums of 11 exposed subjects who had a history of conjunctivitis.

Despite frequent and intense exposure by the respiratory route, there was no history of frequent or severe infections of an influenzal nature, he reported.

### *Tentative Hypothesis*

Evans opinion is that NDV is only capable of producing conjunctivitis in man. The possibility of mild respiratory illness cannot, however, be entirely excluded, he commented, but depends on the emergence of variants with greater human pathogenicity. The ability of some mumps immune serums to inhibit NDV may indicate more than one mumps strain, one of which shares antigens in common with some NDV strains.

As the interaction of certain infectious mononucleosis serum and NDV is mediated only through red cells altered by NDV, this may represent a chance uncovering of a new antigen on the red cell surface by NDV which makes them agglutinable by such serum, he suggested.

## New Antityphoid Agent Shows Promise

A single injection of purified Vi and O antigens, the components of *Salmonella typhosa* considered important in immunization against typhoid infection, evokes the production of higher levels of antibody than a complete course of three injections of the conventional killed bacilli vac-

cine, reported Maurice Landy, Ph.D., chief, department of bacterial immunology, Army Medical Service Graduate School.

On a weight basis, only 10 percent as much of the purified antigens are needed to yield a superior immunological response, he reported.

Elimination of extraneous and possibly harmful bacterial components is also an important advantage offered by the use of purified antigens, he added.

### *New Approach*

This constitutes a new and rational approach to improvement in antityphoid immunization, Landy asserted. Instances where specific antigenic components have replaced whole organisms are rare; in enteric species we have no such examples, he commented. The present study, therefore, probably represents the first instance of the use of these isolated antigenic compounds in man, he said.

Still to be determined, he emphasized, is whether a combination of isolated antigens shown to be superior to existing vaccines in inducing high levels of antibody will likewise be a more effective means of attaining a high degree of protection against natural infection.

### *Experimental Evidence*

Groups of subjects receiving the bacterial vaccines were given three 0.5 ml. subcutaneous injections of the standard heat-phenol vaccine or the acetone-dehydrated vaccine at weekly intervals and bled 28 and 42 days following the initial injection, he said. The isolated antigens were administered in a single subcutaneous injection containing 20 micrograms of O and 40 micrograms of Vi, and bleedings were taken 21 and 42 days later, he reported.

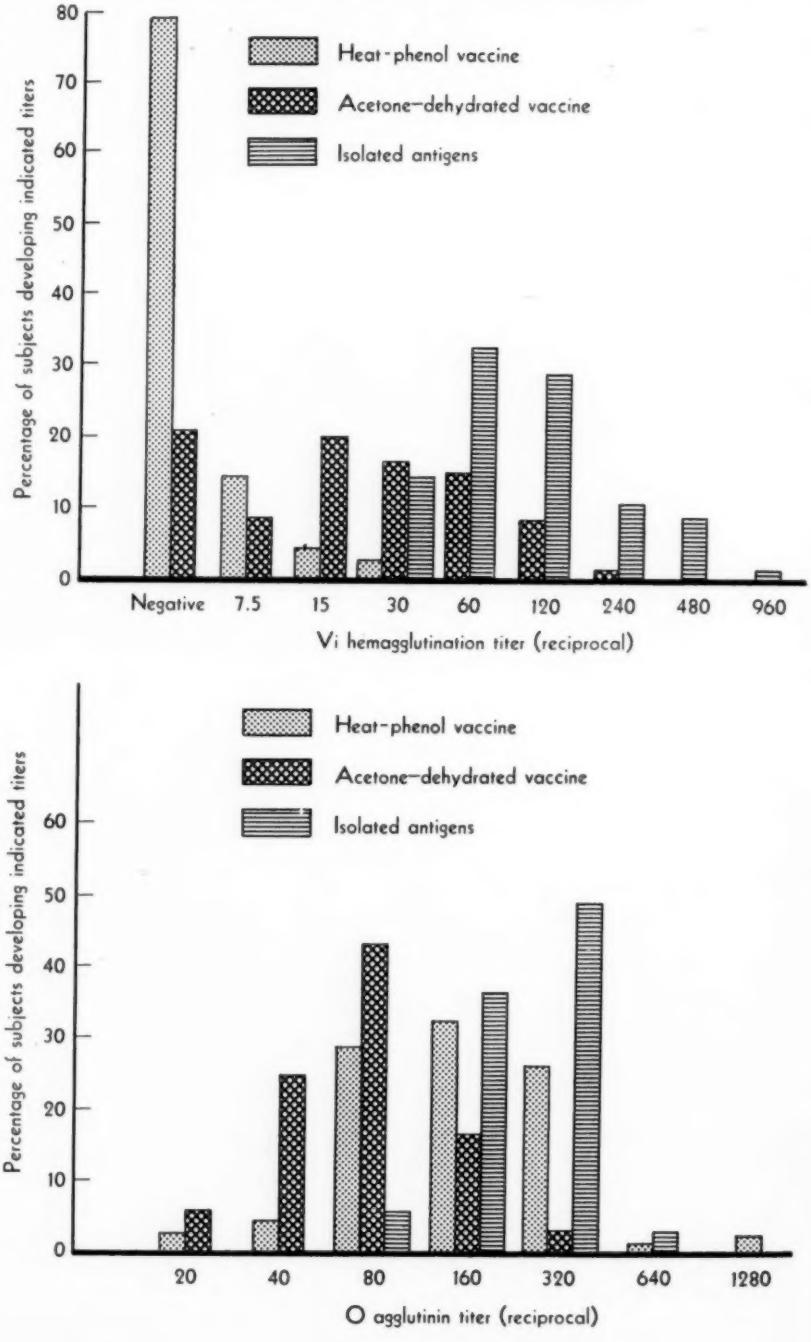
Individuals having a history of previous immunization with standard heat-phenol vaccine, and who showed preimmunization levels of antibody, responded to inoculation in a manner not significantly different from subjects with no such history or antibody levels, Landy said.

All three types of agents tested engendered acceptable O antibody responses in essentially all subjects, regardless of product received, he said.

The acetone-dehydrated vaccine yielded the least, while the isolated O antigen gave the best O antibody levels, he explained (see figure).

With respect to Vi responses, Lan-

**Comparison of Vi (top) and O (bottom) antibody response to three types of antityphoid immunizing agents.**



dy reported, low antibody levels (1:7.5 to 1:30) were obtained in 20 percent of the subjects receiving the heat-phenol vaccine, while 75 percent of the subjects inoculated with the acetone-dehydrated vaccine developed titers ranging up to 1:240.

The isolated Vi antigen, however, resulted in 100-percent antibody response, and the titers developed were by far the greatest, reaching as high as 1:960, he asserted (see figure).

## Effective Immunity Seen Against Typhus Infection

Experience with an avirulent strain of *Rickettsia prowazekii*, reviewed by John P. Fox., M.D., M.P.H., professor of epidemiology at Tulane University, promises to furnish a vaccine against epidemic typhus.

It appears to require but one inoculation to confer effective and relatively durable immunity in contrast to two or more primary doses and booster shots when typhus vaccines prepared from killed organisms are used, he said. Its advantages will protect military personnel and others when louse control is not effective, he added.

### *Strain E Found*

There have been numerous attempts to immunize man against epidemic typhus by means of living rickettsiae. Vaccinations of this type usually resulted either in no infection and no immunity or in infection associated with unmodified and sometimes fatal disease, he commented.

For this reason, Fox stated, in 1946 Sadusk and Kuhlenbeck recommended that living rickettsiae should not be employed for immunization until a strain of demonstrated low pathogenicity for man becomes available.

Fox brought out the following salient points:

In 1943, Clavero and Perez Gallardo reported the chance evolution in embryo passage of a strain of *R. prowazekii* of apparently reduced virulence for experimental animals. This was strain E.

Beginning in 1951 and continuing into 1952, 154 volunteers were given living strain E rickettsiae in varying amounts and by different routes, and an additional 50 volunteers received placebo material or, for comparative purposes, commercially prepared Cox-type vaccine.

Initial interest, of course, centered about the basic safety of strain E for man and the frequency and severity of reactions. Severity and frequency were indicated as directly related to the number of rickettsiae inoculated, but no reactions observed were sufficiently severe to discourage further use of strain E.

It seemed clear that the minimum infecting dose of strain E for man is on the order of 4 log E.I.D.

### *Study at Parchman*

In the work at Parchman, Miss., infecting doses of approximately 4, 5, 6, and 7 log E.I.D. were given by one or another of several routes. There is a direct relation between size of inoculum and maximum level of CF antibody developed within 2 months after inoculation. The relation of immune response to route of inoculation was less uniform. The conclusion reached was that, while intradermal inoculation yielded better results than the subcutaneous route, intramuscular inoculation should be studied further.

Observations as to the duration of serologic immunity, extended over a period of 2 years, are based entirely on the Parchman group. The biggest drop in CF antibody occurred in the interval between 6 and 12 months. The proportion losing detectable CF antibody was greatest in those given smaller inoculums of strain E.

Tests of the actual effectiveness of the immunity in protecting against disease were made by deliberately challenging small groups of volunteers with virulent *R. prowazekii*. No significant clinical disease followed challenge of these men, even when challenge was given 24 months after strain E infection.

As judged on serologic grounds, immunity induced by strain E will not prove to be uniformly of indefinite duration, and, hence, is not fully comparable to that following natural infection. However, effective resistance to virulent challenge appears to endure for at least 2 years. Also, strain E vaccine seems markedly superior to Cox-type vaccine in point of uniformity of serologic response, of duration of serologic immunity, and of effectiveness in preventing disease after challenge.

### *Trials in Peru*

Extended field trials of strain E vaccine were initiated in Peru in October of 1953.

Vaccinated and inoculated control populations, to number ultimately upwards of 10,000 persons each, are being kept under continuous surveillance in selected parts of the mountainous areas of Peru. With approximately 8,500 persons of all ages vaccinated with strain E as a part of this study, no instance of alarming postvaccination reaction has been reported. Insufficient time has elapsed for significant typhus morbidity data to accumulate.

Successful field use in Peru would seem to dispose of the problem of practicability of application. The most important conditions of successful use probably relate to maintaining the viability of the strain E rickettsiae, both during storage of the lyophilized material and after it has been rehydrated.

A final point worthy of consideration is that of the nature of the interaction between strain E rickettsiae and man. The failure to recover the agent from the blood of infected persons and the direct relation between size of infecting dose and level of sero-immune response are reminiscent of earlier observations as to the behavior of strain E in the guinea pig and suggest that in man also it undergoes little or no multiplication.

A vaccine requiring but one inoculation and producing an effective and long-lasting immunity has obvious advantages for use in military personnel during war and in civilian populations at all times when louse control measures cannot be relied upon or effectively applied.

## Varying Booster Responses To Antigens Described

Studies at Letchworth Village in New York State reemphasize the variations in response to reinoculation with different types of antigens, according to the report by Morris Siegel, M.D., M.P.H., associate professor, College of Medicine, State University of New York. These variations, he noted, are important in planning and carrying out effective immunization programs.

Summarizing the pertinent findings, Siegel stated that:

1. An accelerated and very marked increase in circulating antibodies was seen after reinoculation with tetanus toxoid (see chart).

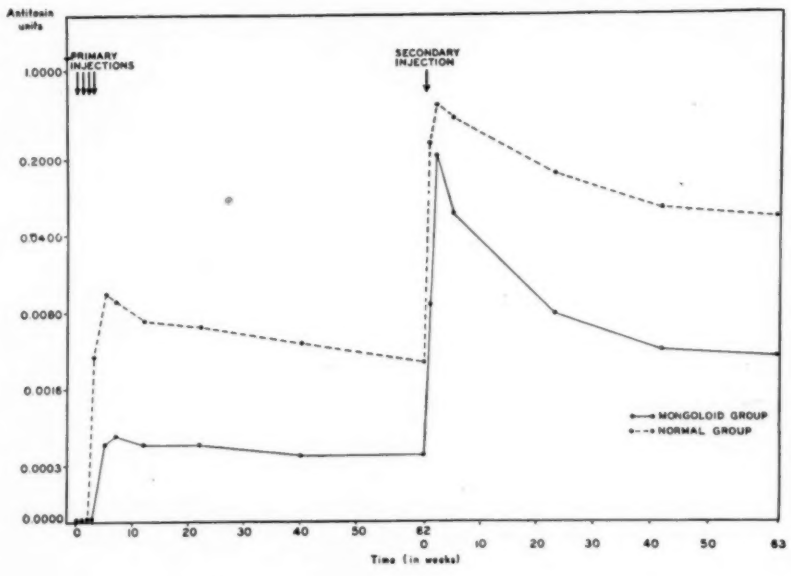
2. An accelerated but somewhat less marked reaction was observed following reinoculation with typhoid vaccine.

3. No increase in antibodies could be detected following reinoculation with pneumococcal polysaccharides until many years after the primary inoculation, when the circulating antibody content of the blood stream was very low or nil.

For the studies of tetanus toxoid and typhoid vaccine, he explained, two groups of 20 male patients each were used, one group having mongoloid characteristics and the other "normal." Two series of subcutaneous inoculations, of each antigen were given, the first consisting of 4 weekly doses and the second, 14 months later, a single dose. The period of observation was 33 months.

The rapid secondary response to a single injection of tetanus toxoid

**Primary and secondary antibody response to tetanus toxoid.**




many years after primary inoculation seems to preclude the necessity of administering antitoxin following minor injury or of repeating an entire series of inoculations, Siegel pointed out in discussing the practical value of the findings of these and other studies.

Under ordinary circumstances, he said, immunity can be maintained at high level by a small booster dose.

He noted, however, that because the secondary response to typhoid vaccine is less marked and less prolonged, the amount of antigen for reinoculation should be larger and reinoculation should be repeated more frquently.

Thus, he stated, reinjection has been recommended every 2 or 3 years under ordinary conditions or every year in epidemic or highly endemic areas.

### *Host Factors*

Variations in secondary response related to host factors were also observed in the tetanus toxoid and typhoid vaccine studies, Siegel indicated. Individual differences, he said, were detectable with each antigen.

An individual's secondary reaction pattern to a specific antigen appeared to be reproducible by the use of a single dose, he noted further, but there seemed to be little relationship between an individual's responsiveness to one antigen and his responsiveness to another.

Siegel also reported that regardless of antigen, the mongoloid patients as a group showed lower antibody content in the blood stream than the nonmongoloid patients.

He stressed the fact, however, that even in the mongoloid group, the response to reinoculation was accelerated.

## Georgia Rabies Decline Follows Dog Immunization

A rabies epidemic in 1946 covered approximately two-thirds of the State of Georgia but declined abruptly after mass immunization of dogs with living attenuated virus vaccine, according to Leland E. Starr, D.V.M., P.D., public health veterinarian, Georgia State Department of Public Health.

In 1954, only 61 dogs were found to have rabies during the months of January to August, he reported.

He compared this figure with 179 positive reactions during the same period in 1953 and noted that the downward trend continued in 1954. Only 3 infections in dogs were reported in July 1954 and 2 in August.

In 1946 at the height of the epidemic, there were 765 positive reactions from dogs, foxes, and other animals. This figure, Starr continued, probably represents only a fraction of the total number of infections. In the same year, he said, 3 persons died of rabies, and 1,735 were treated.

### *New Vaccine*

Mass immunization of dogs has been one of the main objectives of the control program initiated by the Georgia Rabies Act of 1945. This problem, Starr said, has been greatly simplified by the introduction of a live virus vaccine which apparently confers an immunity lasting for several years.

The killed virus brain tissue vaccine, he explained, conferred a relatively weak immunity and made annual revaccination necessary.

Dog owners disliked both the repetition of the immunization procedure and the abscess or paralysis reaction which occasionally followed it. It was found, Starr continued, that, whenever the incidence of rabies in a community was at a low level, interest in immunization could not be maintained. Reimmunization is not being advocated for dogs which received the attenuated virus vaccine, and the product appears to be free of material which might produce severe allergic reactions.

Starr said that mass immunization programs were conducted in 44 counties during 1952, 1953, and 1954. Living attenuated virus vaccine was employed in all but one of the county projects.

Since 1952, he reported, only one proved case of rabies has occurred in a dog inoculated with the new vaccine.

### *Fox Rabies*

Rabies among the enormous number of foxes in Georgia's forests and swamplands also declined in 1954, according to Starr.

Thinning of the fox population by means of trapping and the payment of bounties is another primary goal of the State control program, he said.

Starr does not believe, however, that effective and lasting control can be achieved by a few States. In his opinion, only the coordinating activity of a Federal agency can attain that end.

# Respiratory System Viruses . . .

*The new viruses designated as APC agents are reported as resistant to ether and the antibiotics. Two studies on the RI–67 infections are also reported.*

## Study New APC Viruses From Respiratory Tract

New respiratory system viruses were reported as having been isolated in tissue culture from adenoid and tonsillar tissue removed at surgery and from nasopharyngeal and conjunctival secretions and feces of persons with respiratory illnesses.

The report was made by Robert J. Huebner, M.D., chief of the Virus Section, and Wallace P. Rowe, M.D., medical officer of the National Microbiological Institute, Public Health Service, and Thomas G. Ward, M.D., assistant professor of bacteriology, Johns Hopkins University School of Hygiene and Public Health.

The new viruses are designated as adenoidal - pharyngeal - conjunctival (APC) agents, indicating the important anatomic sites in which they are found. One hundred forty-three strains of virus have been segregated into six immunological types, and additional types probably exist, they said in reporting that :

All types grow readily, producing similar and unique cytopathogenic effects in human epithelial cells and in HeLa cells available commercially. They are resistant to ether and antibiotics. In humans and in rabbits, the viruses produce potent type-specific neutralizing antibodies and lesser amounts of heterotypic responses to other types. Complement-fixing antigens and antibodies produced in comparatively large amounts are group specific but not type specific to about the same extent for all six types.

All six types produce frequent infections in man, beginning at an early age. Serologic surveys in the Washington, D. C., area indicate that 50 percent of infants 6 months to 1 year of age have been infected with at least 1 type. By age 15, the average person has had infections with several types, and by age 34, most persons appear to have had infections with 4 or more types. A few persons were found to have antibodies against all 6 types.

### *APC Virus Evidence*

Intensive investigations are now going on to determine the incidence, prevalence, and specific kind of illnesses produced by these virus infections. Evidence indicates that the viruses of types 3 and 4 cause specific respiratory illnesses. Type 3 has been recovered from numerous cases of acute nasopharyngitis and con-

junctivitis occurring during a winter outbreak on a hospital ward and a summer outbreak in a country day school. Type 4 (Hilleman and Werner's RI–67 agent) apparently produced respiratory illnesses in military personnel described as ARD, primary atypical pneumonia, and acute febrile pharyngitis. Viruses of types 1 and 5 have also been found in cases of acute pharyngitis, but more evidence is needed to establish the role of these and other types in human disease.

A suggested hypothesis is that the APC viruses have a possible role in persistent chronic disease of tonsils and adenoids (and their enlargement). This is based on demonstrations of viruses of 43 strains, classified in 5 immunological types, obtained from persons undergoing tonsillectomy-adenoidectomy and subsequently grown in tissue culture. Possibly more important is the demonstration of viruses in tissues also containing specific antibody against it by the simple expedient of growing such tissues for prolonged periods. This method of "unmasking" viruses represents a highly sensitive and essentially new technique for isolating viruses.

## Virus RI–67 Infection Linked to ARD

Studies of respiratory disease epidemics at a number of military bases in the United States revealed widespread infection, especially among recruits in basic training centers, with the recently discovered RI–67 virus group, according to the report of a team headed by M. R. Hilleman, Ph.D., assistant chief, Department of Virus and Rickettsial Diseases, Army Medical Service Graduate School, Washington, D. C.

The other investigators were Capt. H. E. Dascomb, MC, USA, Lt. R. L. Butler, MC, USA, Capt. J. J. McCue, MC, USA, Capt. R. Stragnell, MC, USA, and J. H. Werner.

During the past year, one investigation, based on serum tests, showed that 77 percent of the men in a newly recruited company at Fort Dix, N.J., were infected with members of the RI–67 group of viruses in the first 8 weeks of training, they announced.

About a quarter of the infected men developed illnesses severe enough to require hospitalization. Dispensary treatment was sufficient for another 25 percent of the cases, and half the men apparently suffered very mild or inapparent infections.

The hospitalized patients had illnesses which the Army team said have been called by such names as catarrhal fever, grippe, and virus pneumonia.

Hilleman and his associates claimed that the diseases resulting from RI–67 group infections fit into two clinical entities whose causative agents had not previously been cultivated in the laboratory.

The entities were described as undifferentiated acute respiratory disease, commonly called ARD, and primary atypical pneumonia of the kind in which the test for cold agglutinins of red blood cells remains negative.

### *Summer Illness*

According to the Army investigators, diseases caused by virus RI–67 occur during the warm months of the year as well as in the cold season.

This was said to be in striking contrast to influenza which is common in winter, late autumn, and early spring but quite rare in summer.

A serologic survey taken to determine the extent of previous experience with RI–67 group viruses in the normal human population revealed that a majority of people have had past experience with these agents.

Infection appears to occur most often during the middle years of life, and to be comparatively rare among younger and older people, according to Hilleman and his co-workers.

Virus strains of the RI–67 group were reported to exhibit antigenic differences which are readily detectable in neutralization tests carried out in tissue culture with serums from human patients with ARD or primary atypical pneumonia. All these viruses, however, elaborated a soluble antigen, common to the entire virus group, which was detectable by the complement fixation test.

The investigators said that these facts made the neutralization test necessary for strain typing and the complement fixation test more suitable for diagnosis.

The Army scientists said that the RI–67 group of viruses are related to the family of latent adenoid and tonsil degenerative viruses discovered in 1953 by Drs. Wallace P. Rowe and Robert J. Huebner, of the National Microbiological Institute, Public Health Service, and others.

## Clinical Syndromes Related To New Virus Groups

Determination of the causative agents of certain acute respiratory diseases has opened the way to the study and discovery of the causes of still others, Harold S. Ginsberg, M.D., and his associates reported.

Associated with Dr. Ginsberg in this study of serums from human transmission and clinical cases were: Eli Gold, M.D., William S. Jordan, Jr., M.D., Sidney Katz, M.D., George F. Badger, M.D., and John H. Dingle, M.D., all with the department of preventive medicine of the School of Medicine of Western Reserve University.

The RI–67 agent has been indicated, they said, to be the cause of a grippelike illness called febrile catarrh, or because of its World War II frequency in military populations, "acute respiratory disease of recruits," or ARD. A viral pneumonia may be part of ARD and caused by the same agent, they said. Acute nonstreptococcal pharyngitis, so-called summer sore throat, has been

demonstrated to be caused by at least two of the "adenoid degeneration" (AD) viruses, they said.

Between the relatively mild common cold and the severe primary atypical pneumonia are two infections—ARD and nonstreptococcal exudative pharyngitis. Their exact identification depends upon the recognition of the etiological agent of each, Ginsberg and his co-workers believe. Their study focused on these two infections.

Ginsberg and his associates stated:

1. The agent which produced ARD in previous human transmission experiments was identical with or immunologically closely related to the RI–67 virus isolated by Hilleman and Werner.

2. Susceptibility to infection from this agent was correlated with the absence of specific neutralizing antibodies.

3. Conversely, some resistance to infection was observed in volunteers whose blood contained specific neutralizing antibodies at the time of artificial infection.

4. The RI–67 or related agent did not induce primary atypical pneumonia of the type characterized by development of cold hemagglutinins or the common cold in volunteers.

The report suggested that the agent that causes the grippelike infection be called the ARD virus, but they did not want their findings to imply that the RI–67 agent is the only virus which may cause ARD. On the other hand, they said, the data clearly indicate that more than one agent is responsible for this clinical syndrome.

### *AD and the RI–67 Agent*

Little difference could be demonstrated between the RI–67 agent and the AD type 2 agent when complement fixation titrations were done, Ginsberg and his associates said. The AD agent appears not to be implicated etiologically with the classical forms of ARD or with primary atypical pneumonia, but the evidence indicates that the type 3 agent is related to nonstreptococcal pharyngitis, and that other agents, one of which is a type 2-like virus, they said, may initiate the disease. They think that in a single, relatively sharp epidemic, more than one agent may be active; and that neutralization titrations are essential.

One of their findings was that complement fixation titrations cannot be employed to relate the specific etiology of an acute respiratory disease to the RI–67 or AD agents.

# Poliomyelitis . . .

*Looking to this spring for the report on the Salk vaccine . . . Studying the growth of the virus in the cotton rat fetus.*

## Poliomyelitis Virus Grown In Cotton Rat Fetus

A new experimental animal, the cotton rat fetus, may now be used to produce and to study type 2 poliomyelitis virus, according to Fred W. Gallagher, Ph.D., department of bacteriology and preventive medicine, University of Vermont College of Medicine.

One of the advantages found in using the fetal brain to propagate type 2 virus is the high concentration of virus produced, he reported.

This high concentration and the large number of fetuses in a single litter makes possible substantial yields of virus material from one pregnant rat, he commented, and this should interest scientists producing virus for antigen in the complement fixation test or for the production of vaccine.

Other advantages Gallagher reported are:

Vaccine made from fetal brain tissue does not produce an encephalomyelitis as adult mouse brain tissue vaccine may when injected into monkeys.

Small quantities of virus in the inoculum suffice to grow large quantities of virus in the fetus. Thus, the fetus might prove to be a delicate test animal for control use on the inactivation of virus, or for primary isolation of virus from clinical material. Since the virus does not pass from fetus to fetus, several tests may be conducted simultaneously in a single pregnant cotton rat.

### *Method and Results*

Following Woolpert's technique for injecting fetuses, 21-day pregnant cotton rats were used, he said.

The gestation period of the cotton rat is 26 days, and 21-day-old fetuses are large enough for accurate inoculation and yet allow for an incubation period of 4 days, he explained.

In a few cases incubation periods of 2 and 3 days were used, but results were poor, he commented.

Three strains of type 2 virus were used in the experiments, he stated, although most of the work was done with a strain of Lansing virus obtained through the American Type Culture Collection. The other two strains were a Lansing type maintained at the school laboratory for many years by mouse brain passage, and an M.E.F.$_1$ virus.

Three routes of inoculation were employed, intracerebral, and the thoracic and abdominal cavities, he continued, but the intracerebral route proved best.

In comparative titrations, fetal

brain material was found to contain virus about 100 times as concentrated as the same strain grown on adult mouse brain, Gallagher reported.

Success in the propagation of type 2 poliomyelitis virus in the cotton rat fetus suggests the possibility of growing type 1 and type 3 virus if the right host is found, Gallagher asserted.

Preliminary tests, he added, have indicated that type 1 virus will grow in fetal hamsters.

The poliomyelitis vaccine evaluation center at Ann Arbor is under the direction of Dr. Thomas Francis, Jr., chairman of the department of epidemiology at the University of Michigan.

# Tuberculosis Research . . .

*Laboratory studies of the virulence of isoniazid-resistant tubercle bacilli are reported in the two papers in this section.*

## Report on Salk Vaccine To Be Made Soon

A report on the effectiveness of the Salk poliomyelitis vaccine may be made in the spring of 1955, according to Robert F. Korns, M.D., deputy director of the poliomyelitis vaccine evaluation center at the University of Michigan.

Korns, who is on leave from his post as director of epidemiology and communicable disease control for the New York State Department of Health, reported that 27 research laboratories and 1,800,000 children are participating in the program to evaluate the vaccine. Funds from the National Foundation for Infantile Paralysis are supporting the study.

In addition to painstaking tests concerning children who contract poliomyelitis, blood tests are being performed on samples collected on three occasions from approximately 40,000 other children in the field trial study group.

About 435,000 children in 217 areas of the country have received one or more injections of the vaccine developed by Dr. Jonas E. Salk and his associates at the University of Pittsburgh under National Foundation grants. Another 210,500 have received one or more injections of a placebo. More than 1,175,000 additional youngsters received no injections, but are participating in the vaccine field trial by serving as a control group.

## Report Isoniazid Effects On Tubercle Bacilli

Confirming some findings in recent literature, Robert A. Patnode, Ph.D., and his associates, Martha C. Dail and Paul C. Hudgins, reported that strains of tubercle bacilli isolated from isoniazid-treated patients were found to be less virulent for guinea pigs than typically virulent H37Rv strain. However, they found no correlation between the reduction of virulence and the degree of resistance to the drug in vitro.

Dr. Patnode and Mr. Hudgins are with the Washington (D. C.) Veterans Administration Hospital and Miss Dail is at the Army Medical Service Graduate School of the Walter Reed Army Medical Center. They used 13 cultures from resected necrotic lesions of patients who had received long-term isoniazid therapy (6 months or longer). Dr. Patnode and his associates found the organisms did not differ from the H37Rv strain (used as a control) in their ability to bind neutral red and to form cords or in their ability to decolorize certain oxidation-reduction dyes.

The results of these growth studies, they said, seem to indicate that the organisms have not lost their virulence for guinea pigs solely by virtue of having acquired a special growth requirement for a substance not available in normal guinea pig tissue.

The study, they said, seems to indicate that the altered growth characteristics in vitro and the reduced virulence for guinea pigs are not necessarily based on the same mechanism.

In this experiment, guinea pigs weighing on the average 225 grams were inoculated subcutaneously in the right inguinal region with 0.5 ml. (1.5 mg.) of 15-day-old cultures of the test organisms. Tween albumin medium containing a concentration of isoniazid lower than the minimal inhibiting concentration was used.

## Tubercle Bacilli Resistance To Isoniazid Needs Study

The virulence of isoniazid-resistant tubercle bacilli in human beings is still in doubt, although some correlation exists between development of resistant organisms and lack of improvement of patients when isoniazid therapy is continued, reported Daniel Widelock, Ph.D., assistant director, Lenore R. Peizer, senior bacteriologist, and Sarah Klein, bacteriologist of the bureau of laboratories, New York City Department of Health.

Results of laboratory experiments to determine the extent of the risk involved in the spread of isoniazid-resistant tubercle bacilli by unhospitalized patients and the extent to which these organisms are responsible for the maintenance and spread

of active lesions in individual patients accentuated this doubt, Widelock and his co-workers said.

They found that isoniazid-resistant tubercle bacilli played little, if any, part in the formation of tubercles in either guinea pigs or mice when the animals were injected with mixtures of isoniazid-resistant and isoniazid-sensitive organisms. However, the resistant organisms multiplied and produced tuberculous lesions in the lungs, spleen, and liver of guinea pigs with concomitant enteritis. Also, when grown in a drug-free medium, isoniazid-resistant organisms became isoniazid-sensitive in vitro, and when resistant organisms were found in a patient, bacteriological findings became worse.

### *Further Studies Needed*

Widelock and his colleagues said that possibly resistant organisms have no part in the maintenance and spread of tuberculous lesions in human beings. They suggested that sensitive or only partially resistant organisms may produce the lesions but may not be eliminated by the drug, and that they may multiply as sensitive organisms and maintain the active disease. Resistant organisms, which play no part in the formation of new lesions, may be produced at the same time.

Further study is needed, they stated, to determine the virulence or avirulence of isoniazid-resistant tubercle bacilli. This requires a correlation between clinical findings and a quantitative study of resistant and sensitive tubercle bacilli in the sputum of patients. Widelock and his co-workers are attempting to do this by a quantitative catalase test, considered valuable in the rapid determination of the percentage of resistant and sensitive tubercle bacilli in cultures.

# Business Management . . .

*Standardization of the key terms used for public health budgeting is urged, and the use of the fixed-variable technique in controlling public health program costs is explained. Health department savings may be accomplished in a number of ways—one department replaces old automobiles with a pool of leased cars.*

## Program Budgeting Terms Need Standardization

A happy nomenclature may have more influence than rigorous logic on the acceptance of a new idea, and proper association of words and meanings may be a key factor in the development of understanding of the basic concepts and methods of program or performance budgeting, stated John G. McKevitt, M.P.A., director, administrative services division, Michigan Department of Health.

Budget terms and meanings are borrowed from various sources, such as accounting, political science, law, statistics, and taxation, and, in public health programs, from the specialized vocabulary of public health, McKevitt continued. He said that, although most of these terms are well defined and well understood, many are peculiar to program budgeting. Some terms are synonymous, but others are used synonymously when there is actually a significant difference in their meaning.

### *Common Definitions*

McKevitt cited an article in which the terms "performance budget," "functional budget," and "program budget" were all used, apparently interchangeably. "Performance," "functional," and "program" are not pure synonyms in everyday English, he said, although some writers use them synonymously. To question the usage of such elementary terms may seem petty, he stated; nevertheless, "the practical aspects of common definitions should be insisted upon."

According to McKevitt, performance budgeting demands coordination between budgeting, accounting, and reporting. These are general accounting terms which may have to be adapted somewhat if they are to meet the requirements of performance budgeting.

Standardizing definitions is a major accomplishment in any discipline, McKevitt stated. Performance budgeting is comparatively new, and experience will be necessary before refined definitions can be worked out. Several organizations are interested in the problem, and several reports of studies on budgeting and accounting terminology are available or in preparation.

"However," concluded McKevitt, "if we are to reduce the influence of chance in the development of a vocabulary for performance budgeting, we must all be aware of the importance of cooperating in the efforts to develop such a vocabulary systematically."

## Fixed-Variable Technique Tests Costs Behavior

The fixed-variable approach to cost control, a technique being used in industry, is a valuable supplement to sound planning and intelligent control of the cost of public health programs, said Wilson T. Seney, B.A.,

a management consultant, New York City.

Seney defined fixed costs as those incurred in order to be ready and able to do work; variable costs, as those incurred only when work is done. For example, the salary of a roentgenologist is a fixed cost, he said, and the cost of X-ray film varies with the number of examinations made. Fixed costs, he explained, are committed in advance of accomplishing a defined program, whereas variable costs, in contrast, are much more controllable, as they are not incurred until the work is done.

Relating costs to the reasons why they are incurred is the best way to deal with them, Seney said. For example, in a public health agency, the only reason for incurring costs is to achieve some definite result, he maintained. Costs, therefore, should be related to the amount of work done or to the results achieved. Some costs are 100 percent fixed, some are 100 percent variable, and others fall somewhere between these two classifications.

Seney claimed that the fixed-variable technique carries basic budgeting costs to their logical conclusion and helps to plan expenditures in advance and to see that they are used efficiently.

According to Seney, sound cost control means long-range planning, program budgeting, comprehensive budgeting of all costs for each program, techniques to estimate the costs of different methods of doing each job, and individual responsibility for certain costs.

### *Planning and Performance*

Study of the fixed and the variable costs of two proposed programs of equal merit will provide valuable information which cannot be obtained in any other way and which will help in deciding which program is the more desirable from the standpoint of cost, Seney continued. Such a study helps in long-range financial planning; it indicates the cost of a program in more meaningful terms, and it makes possible comprehensive statements which account for all factors of cost.

Better performance reports are possible with the fixed-variable method of budgeting, Seney said. In a hospital, for example, it is essential to successful performance budgeting that the director be expected to control fixed costs only in terms of living within the fixed cost allowances, but he should be made accountable for variances from the budget allowance for variable costs.

## Can't Buy New Cars? Wyoming Leases Them

A new plan providing for leasing arrangements of acceptable and safe transportation was described by Hale Laybourn, administrative officer of the Wyoming State Department of Public Health. The department studied the plan when cut appropriations did not provide enough funds for replacement of old vehicles, Laybourn told his hearers.

The agreement for leasing cars was entered into with a Wyoming firm, after bid proposals. It covers oil changes, lubrication, maintenance, repairs, tuneups, tire replacements, license plates, and 15,000 miles per year for 2 years at a monthly rate of $65 per unit, with an additional charge of 1 cent per mile for all mileage beyond the set amount. At the present time 11 automobiles are provided by the lease arrangement.

Laybourn stated the average cost per automobile unit since the plan went into effect in September 1953 was 6 cents per mile.

### *Fleet Rates*

The department, Laybourn said, contracted for its own insurance at fleet rates, approximately $65 per unit per year. Gasoline purchased from State-owned highway garages costs about 20 cents per gallon. An attractive feature of the leased car plan, Laybourn stated, is the personal mileage allowance of one-third of the 15,000 miles annual allowance to the employee. The driver is charged a flat rate of $20 per month, $2.25 per month for insurance and actual cost for all accessories, and 1 cent per mile for all miles driven in excess of the allowed 5,000 miles per year.

### *Pros and Cons*

Laybourn listed these advantages to the State: (1) eliminates the not always successful pool system or assignment of State-owned cars; (2) avoids the need for original capital outlay required in purchasing new cars; (3) eliminates some records, vouchers and purchase orders because maintenance, oil change, lubrication, and tire replacement are shifted to the lessor; (4) obtains safe and good operating vehicles every 2 years; (5) and obtains for the employee economical personal transportation—$25 to $35 per month—and for the department, economical transportation costs at approximately 6 cents per mile. Employee morale is improved.

The disadvantages, Laybourn said, include additional auditing and record maintenance to insure that the costs to the department and the miles driven on business are equitable, within the legal limit, and fairly charged.

### *Problems Remaining*

Some problems that remain to be resolved, the administrator thinks, are: (1) Is it better to prorate the charges for personal mileage on a monthly rate or on a mileage rate? (2) Should a different insurance coverage for collision be considered? (3) Can a better arrangement for oil changes, lubrication, and maintenance be applied?

## Kansas Estimates Savings From Health Activities

State and local public health activities can be dramatically justified from an economic viewpoint in the

opinion of four members of the Kansas State Board of Health.

Reporting on a study which estimated the savings accomplished by the board were Thomas R. Hood, M.D., M.P.H., executive secretary; Russell L. Culp, M.P.H., chief of the water resources section; Charles A. Hunter, Ph.D., director of public health laboratories; and Bertha H. Campbell, director of health information services.

It is important to the consumer to know whether public funds are purchasing something of value and what return may be expected from the investment, Hood and his colleagues said.

They discussed two methods of approach to compiling data on the economic value of public health services—the calculation of actual savings brought about by public health programs and comparing the cost of a service provided by a government agency with the cost of the same service purchased from private enterprise.

*Estimating Savings*

Savings may be calculated in several ways, Hood and his colleagues said. Among these are comparison of annual costs of particular diseases over a period of time; listing the cost of judgments against local governments for disease and death following outbreaks of preventable disease; and calculation of the financial savings in insurance claims following a program of health education, early diagnosis, and nursing service among policyholders.

As an example of the economic value of public health activities, they stated that in Kansas, installation of public sewers in new homes simultaneously with construction has resulted in an estimated annual saving of $2 million in three counties alone.

Another example of the economic value of the contribution of the sanitation division is the $4.7 million saving resulting from the recovery annually of 1.8 million barrels of oil from waste oil brine.

Hood and his co-workers cited as other sources of savings through public health programs: control of waterborne diseases; consultation services to cities, schools, and individuals on matters of water supply, sewage and waste disposal, insect and rodent control, general sanitation, and other domestic and municipal problems; review by engineers of the sanitation division of reports, plans, and specifications submitted by consulting engineers; control of corrosion of water mains and storage reservoirs; control of water pollution; and reclamation of waste products from water.

# Venereal Disease Studies . . .

*Laboratory examination is the only completely reliable method of confirming gonorrhea, one that will protect the patient and the physician and at the same time be acceptable from a medicolegal standpoint. The reliability of analogies between experimental syphilis in animals and infections in man has been demonstrated in a study of inoculation syphilis at New York's Sing Sing Prison.*

## Urges Lab Confirmation Of Gonorrhea Diagnosis

With the increase in reported cases of gonorrhea, it is important to know what diagnostic method has been used as a basis for a positive report to the health department, according to Lt. Col. Paul S. Parrino, Capt. Edward J. O'Shaughnessy, and Lt. John D. White. Health departments should insist that the method of diagnosis be stated on all reports of cases of gonorrhea, they said.

Colonel Parrino is preventive medicine officer, United States Army Hospital, Camp Kilmer, N. J.; Captain O'Shaughnessy is urologist and Lieutenant White is research bacteriologist with the genitourinary research project at the hospital.

Information regarding the method of diagnosis has become particularly important during the last 2 or 3 years, they continued, since reports on studies of nongonococcal urethritis in the male indicate that many cases have been erroneously treated as gonorrhea because of unreliable diagnostic methods. They stressed the importance of uniform diagnostic methods and recommended the universal adoption of the methods described in the American Public Health Association manual, "Diagnostic Procedures and Reagents."

Sufficient funds should be made available to staff all health department laboratories with technicians well trained in the procedures for diagnosing gonorrhea, they stated.

Of the four methods for diagnosing gonorrhea—laboratory, clinical, therapeutic, and epidemiological—only laboratory procedures can be relied upon completely, they asserted, and from the medicolegal standpoint, "complete identification of the gonococcus by cultural techniques is the only method that is acceptable." It is the only one that will protect both patient and physician, Parrino and his co-workers said.

If reliable laboratory services are not immediately available, diagnosis can be made from history and physical examination, but "reliance upon

clinical evidence introduces a very large error," they reported. However, in a high percentage of cases in the male, a correct diagnosis can be made on the basis of differences in length of incubation period, predominant symptom, and character of discharge in gonococcal and in nongonococcal infections.

Diagnosis can also be made on the basis of therapeutic response to penicillin, Parrino and his coworkers stated, but the large proportion of cases of nongonococcal urethritis reported to have been diagnosed originally as gonorrhea but which were not cured by penicillin "is further evidence for more efficient application of recommended laboratory procedures." Also, large doses of penicillin administered to cases diagnosed as gonorrhea without adequate laboratory procedures will contribute to the development of penicillin-resistant organisms, they pointed out.

demonstrates the reliability of analogies between experimental syphilis in rabbits and infections in human beings. In the past, any such analogies were subject to question because of the differences between the two species.

### *Post-Treatment Infection*

That reinfection is possible following curative treatment for syphilis was one of the conclusions reached. The study showed that after treatment for early syphilis, reinfection is accompanied by new early syphilis type lesions. Following treatment for late syphilis, some individuals may become reinfected, with development of lesions which, in some cases, were gummatous in nature.

Some of the study group who had been previously treated for latent syphilis may have been protected from the experimental infection by prior injection of a vaccine of killed *Treponema pallidum*.

Data from the study also suggests that time since treatment may have influenced the possibility of experimental infection in those who had originally been treated for latent syphilis, leading to the implication that immunity to reinfection in this group declines with the passage of time.

Thomas and his associates reported that persons who had been recently treated for latent syphilis were less likely to be infected by the experimental inoculation than were those who had been treated 10 or more years prior to the study. Patients who had been treated for early syphilis could be reinfected experimentally no matter how recently they had been treated. Need for further studies in the development of immunity for syphilis was stressed.

## Sing Sing Syphilis Study Confirms Rabbit Tests

A 15-month well-controlled investigation of inoculation syphilis in man conducted during 1953–54 at New York's Sing Sing Prison confirms many of the findings gained from animal experiments. The study was made possible by the proved efficacy and safety of penicillin therapy for syphilis and by the cooperation of 62 prison inmates who volunteered for the investigation.

The study was reported by Evan W. Thomas, M.D., Lopo de Mello, M.D., Bernard Kaplan, M.D., John C. Cutler, M.D., Harold Magnuson, M.D., and Sidney Olansky, M.D. Dr. Thomas is epidemiologist and Dr. de Mello is venereal disease consultant, New York State Department of Health; Dr. Kaplan is medical officer of Sing Sing Prison; and Dr. Cutler, Dr. Magnuson, and Dr. Olansky are with the Public Health Service's Venereal Disease Branch.

In general, the Sing Sing study

# Studies on Brucellosis . . .

*A safe, effective test for use in epidemiological studies of human brucellosis is suggested. A new laboratory method for diagnosing brucellosis and a growth factor for a Brucella strain difficult to colonize are described. Attempts to eradicate brucellosis in animals are reported.*

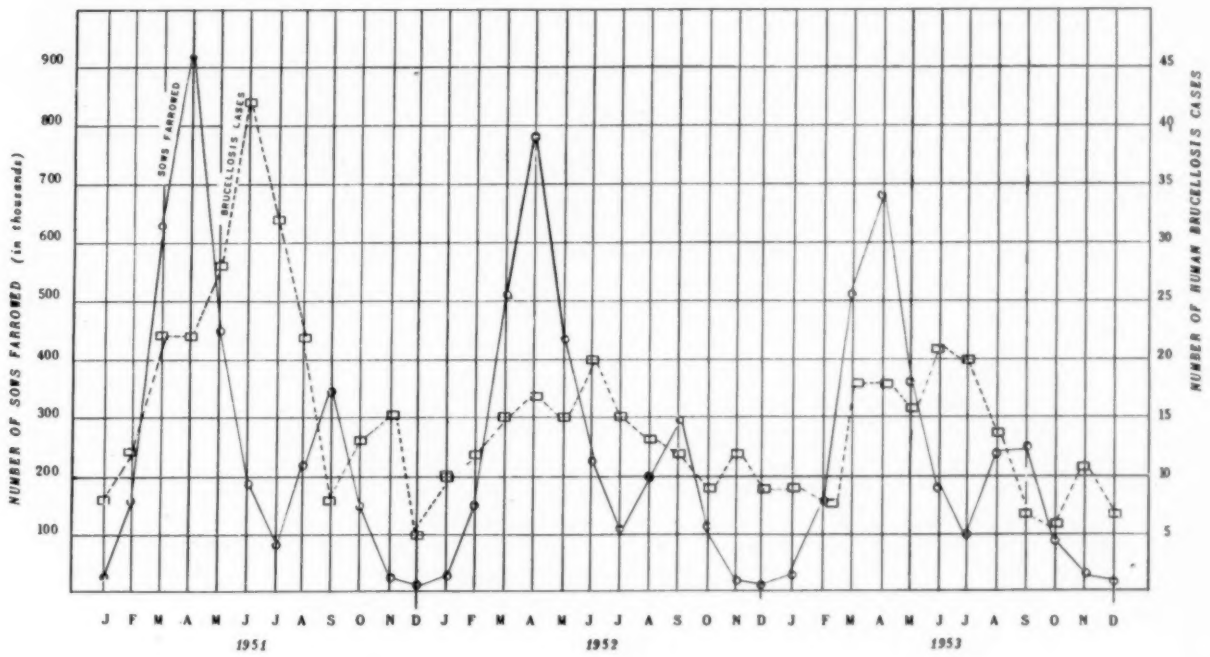
## Iowa Reports on Control Of Animal Brucellosis

Only the complete eradication of brucellosis in animals will prevent the disease in human beings, declared Stanley L. Hendricks, D.V.M., M.P.H., public health veterinarian, Iowa State Department of Health, Des Moines. In Iowa, he said, brucellosis is the most frequently reported of the animal diseases transmissible to man.

Apparently an increasingly larger proportion of brucellosis cases result from animal contact and an increasingly smaller number result from drinking contaminated raw milk, Hendricks continued.

Investigations of brucellosis cases in Iowa from the time the first case was reported in 1926 to the end of 1953 also indicate that the skin is important as a portal of entry for *Brucella* organisms, that there is danger of *Brucella* infection when hogs are allowed to mingle with dairy cows, and that *Brucella meli-*

**Number of sows farrowed, by month, and reported brucellosis cases among male farm workers, by month of onset, Iowa, 1951–53.**




*tensis* occurs in both man and hogs, the veterinarian said.

Hendricks based his report on 2,047 cases of brucellosis reported in Iowa for the 3-year period 1951–53. The cases were scattered throughout the State, he said, but the larger number occurred in counties in which large packinghouses are located.

Of 720 cases for which information on both occupation and sex are available, 51 percent were male farm workers, 22 percent were packinghouse employees, and 10 percent were housewives, he said. More than three-fourths of the housewives lived in rural areas and were exposed to much the same risks as male farm workers. Comparison of the distribution of cases by sex and age indicated that the proportion of male cases is increasing and that in Iowa the majority of cases occur among persons in the 30–49 year age groups.

### *Seasonal Occurrence*

June, July, and August were the months of highest incidence of brucellosis, Hendricks said. The month of onset varied among persons in several occupations, with the most marked variation among male farm workers; about 2½ times as many reported beginning symptoms in June as in January. The number of brucellosis cases among these workers increased in the spring and fall, following the date of sow farrowing by about 2 months (see chart).

Preceding their illness, 80 percent of the persons in the 1951–53 group of brucellosis patients either came into contact with animals or animal excretions in the course of their regular occupation or had such contact outside of their daily work, he said. In several instances, the cases reported apparently resulted from environmental contact, he reported.

The brucellosis patients drank milk from a number of sources, Hendricks stated. Many farm families have pasteurizing units and some of the farm patients used only pasteurized milk bought from a dairy, but 87 percent of those using milk from their own cows drank it without pasteurization, he said.

Hogs, however, are apparently the principal source of *Brucella* infections in Iowa, according to Hendricks, and the approximately 20 million hogs produced in the State each year make up a large potential reservoir of brucellosis.

Iowa is making progress toward the prevention of brucellosis in human beings through the eradication of brucellosis in animals, Hendricks stated. The milk ring test is being used to screen herds of cattle which may contain infected animals; suspected herds are being blood tested; more calves are being vaccinated, and a program for control of brucellosis in swine has been started, with the objective of developing brucellosis-free breeding herds.

## Urges Intradermal Tests For Brucellosis Surveys

Intradermal tests, using brucellergen, in epidemiological studies on human brucellosis are safe and are more effective than agglutination

tests for detecting inapparent, latent, and chronic infections, according to a California study. Brucellergen is a protein nucleate prepared from *Brucella abortus*, *Brucella suis*, and *Brucella melitensis*.

The study was presented by Charles M. Carpenter, M.D., Clinton E. Tempereau, M.D., Ruth A. Boak, M.D., Thomas Brem, M.D., George M. Leiby, M.D., Benjamin F. Klaumann, M.D., and Frederick W. S. Modern, M.D., of the department of infectious diseases, University of California School of Medicine, and of the Investigative Medicine Service, Long Beach Veterans Administration Hospital.

Chronic brucellosis morbidity has, as yet, not been satisfactorily evaluated because of a lack of dependable diagnostic methods, they declared.

Data on the epidemiology of human brucellosis have been derived chiefly from reports of cases of acute undulant fever from which *Brucella* has been isolated, agglutination tests on blood of chronically ill hospitalized patients, and agglutination tests of blood submitted to public health laboratories for serologic tests for syphilis, they said.

### *Intradermal Tests*

The dermal sensitivity test for brucellosis has been well-established and resembles the tuberculin test, they declared. The basic problem confronting the investigator, they commented, is the differentiation of immunity from active infection in persons with dermal sensitivity.

Tests for the present study were made by injecting 0.1 ml. of brucellergen intradermally in the forearm and results were read after 48 hours, they said. The authors reported they experienced no difficulty with false-positive reactions or severe reactions from those patients with marked dermal sensitivity.

The results of the present study fell in line with the studies reported in the literature, they commented. Findings reported were: Of 900 hospitalized patients tested, 223, 24.8 percent, reacted positively; 53 well persons of 500 tested, 10.6 percent, were positive; 73 Tahitians, never previously in contact with the infection, all reacted negatively; only 3 of 100 hospitalized children reacted positively.

## Brucellosis Test Method Gives Uniform Results

Microscopic slide and macroscopic tube flocculation tests for brucellosis, which give clear and easily read results, can be performed rapidly and can be reproduced in any laboratory, according to Charles A. Hunter, Ph.D., director, and Bernice L. Christesen, B.S., division of public health laboratories, Kansas State Board of Health.

A newly developed method for coating cholesterol with *Brucella* organisms or extract produces an antigen that can be adjusted to standard sensitivity and specificity, they asserted.

Since the use of cholesterol coated with cardiolipin and lecithin as an antigen has made it possible to standardize serologic tests for syphilis, Hunter and Christesen believe a similar process can produce a standardized test for brucellosis and decrease mistakes in interpretation of titer. They do not believe that the use of one particular strain of *Brucella* will produce an antigen for a standard test.

Antigen emulsions prepared by the new method may be used immediately or for at least 8 days after storage under refrigeration, they said. Microscopic and macroscopic flocculation tests have been compared with agglutination tests using this antigen and their results are easier to read and give a sharper end point than tests generally in use, they reported.

Contrary to recommendations in current agglutination techniques, Hunter and Christesen found that inactivation of the serum at 56° C. for 30 minutes reduces prezone reaction and produces results which are relatively clear and easily interpreted.

It is doubtful that interpretation of results obtained from agglutination tests can ever be standard, they said. But, they added, flocculation tests, which may be adopted in standard form in any laboratory, using antigen produced by this new method, may eliminate most of the difficulties experienced with present agglutination techniques.

## Growth Factor Found For Fastidious Brucella

Discovery of a biochemical agent which promotes the colonial growth of a fastidious *Brucella* strain was reported by I. Forest Huddleson, D.V.M., Ph.D., of the Michigan State College Department of Bacteriology and Public Health. He identified the agent as an albuminous substance or one closely associated with this fraction.

Huddleson, in attempting to find a medium to promote the growth of the $CO_2$ dependent type II (Wilson) strain *Brucella abortus*, used three agar and liquid media—tryptose, trypticase soy, and peptone M. His experiments revealed that the growth factor is contained either in a completely soluble extract from sonically disintegrated cells of *Brucella suis* or *Micrococcus aureus*. It can survive a heat of 120° C. for 30 minutes.

Demonstration of the factor, he indicated, makes possible the isolation of *Brucella* strains from infected humans and animals. As a result of its presence, agar cultures of tryptose and peptone M were converted from unsatisfactory to highly satisfactory media.

Huddleson experimented with killed and living cells of *Brucella bronchisepticus*, *Salmonella pullorum*, and *Salmonella typhosa* (Vi type) in addition to *B. abortus*, *B. suis* and *M. aureus*. He extracted

dense cell suspensions of the latter two micro-organisms by sonic disintegration in a magnetostriction type of apparatus kept cooled to 15° C. by flowing tap water. He then separated the extracts into purified and crude fractions by $(NH_4)_2SO_4$ fractional precipitation and tested the fractions for growth possibilities on the various media. Except for pH adjustment, the media were prepared according to the manufacturers' formulas. Preliminary studies of the purified fraction indicated the chemical nature of the growth factor.

# Cancer Research and Control . . .

*Occupation does not seem to be directly related to lung cancer incidence among smokers. Cobalt 60 beam therapy is discussed, and the value of cancer public education programs is assessed. The contribution of epidemiology to etiology is the subject of still another report in this series of papers.*

## New York Studies Cancer Factors in Occupation

The possibility that the factor of occupation does not account for the higher incidence of lung cancer among smokers was indicated in a study of the occupational histories of cancer patients at Roswell Park Memorial Institute.

The study also indicated that the excess of lung cancer attributable to several specific occupational groups cannot be explained by smoking.

The study was sponsored by the New York State Occupational Cancer Committee. The report was presented by Morton L. Levin, M.D., Arthur S. Kraus, M.S., Irving D. Goldberg, M.P.H., and Paul R. Gerhardt, M.D., who serve, respectively, as assistant commissioner for medical services, acting associate biostatistician, senior biostatistician, and director of the bureau of cancer control of the New York State Department of Health.

### *Study Conditions*

One-hundred thirty-seven male lung cancer patients, and a control group of 396 cases with nonrespiratory cancer, which had an age-residence distribution equal to that of the lung cancer group, were studied, they explained.

The study, they said, was made primarily to find clues for further study of occupations with an apparent excess risk of cancer of various types. The patient's occupation history included all previous employment.

A team of industrial chemists compiled a list of probable exposures to various chemical and physical agents, including suspected carcinogenic agents. Thus, specific information from the patient and the judgment of industrial chemists were used in determining possible exposure to various physical and chemical hazards.

### *Results, Discussion*

Out of 18 major occupation groups, two, the metal trades and the construction industry, occurred significantly more frequently at the 0.05 percent level in the lung cancer group than in the control group, they reported. Exposure to free silica and to iron dust and excessive heat for 14 years or more for foremen, craftsmen, operatives, and laborers occurred significantly more frequently in the lung cancer group than in the control group, they explained.

Individuals employed in the significant occupations comprised 45.3 percent of the lung cancer cases and 27.8 percent of the control group, they reported. It appears that the excess risk attributable to occupation among persons in various smoking categories ranges from 1.5 to 4.3 times the risk in nonsignificant occupations, they said.

It would also appear from these tabulations that occupation exerts the least effect on heavy cigarette smokers and that heavy cigarette smoking exerts its greatest effect on occupations not associated with lung cancer, they commented.

## Cobalt 60 Beam Therapy Aids Cancer Patients

Patients suffering from some types of inoperable lung, rectal, and bladder cancer can expect a better chance of cure from extensive research with cobalt 60 beam therapy, said Ivan H. Smith, M.D., director of the Ontario Cancer Foundation, London Clinic, Victoria Hospital, London, Ontario.

This new form of irradiation, he continued, also promises longer life and reduced suffering for patients with incurable rectal, gastric, and pancreatic cancer. Another use of cobalt 60, he predicted, will be in connection with surgery, particularly as a postoperative technique.

Smith made an interim report on 1,149 cases treated since the clinic began its clinical investigation on October 27, 1951. No conclusive results can be given for the new method of treatment, he said, since cancer cures aren't regarded as certain until the patient has lived for 5 years after therapy.

He referred to the response of lung cancer patients to cobalt 60 as "most

gratifying and often dramatic." The treatment was beneficial, in some degree, to 50 patients, 72.5 percent of the 69 cases treated, 70 percent of whom were in an advanced stage of the disease. Three of them are living 24 months after treatment and 27 have survived for 4 to 16 months, he reported.

### *Rectal Cancer*

It is Smith's opinion that in some cases of rectal cancer, cobalt$^{60}$ offers a palliative alternative to surgery for a limited group of elderly patients or "the odd cantankerous rogue" who refuses to have an operation. Improvement was seen in 25 patients or 75 percent of the 33 cases available for study. In most of them the disease was either advanced or had recurred after other forms of treatment. This is one of the forms of cancer for which Smith recommended the use of postoperative cobalt.

Smith said that cobalt has brought relief from pain and restoration of appetite to 10 out of 20 frail or elderly individuals with inoperable stomach cancer. Six of them are living 5 to 16 months after treatment. As a rule, the improvement is temporary, he said, and is followed by a later return of symptoms. He believes, however, that X-ray rotation therapy and a combination of chemotherapeutic agents should hold additional promise.

Cancer of the larynx is another type of malignancy for which Smith recommended cobalt$^{60}$ as the initial form of therapy with reliance on surgery if the disease recurs. He has also, he said, obtained worthwhile results with cobalt$^{60}$ in cases of oral cancer, relying on surgery in the event of complications or recurrences.

### *Cobalt Advantages*

The advantages of cobalt irradiation over conventional X-ray treatment, according to Smith, rest in the fact that a greater dosage of rays can be directed to tissues and organs in the interior of the body with less danger to surface and other intervening tissue. He also believes cobalt enables patients to tolerate a greater dose of irradiation to a particular organ and the body in general in a shorter time.

There is still, however, a narrow breach between the amount of irradiation from any source which can be tolerated by normal tissue and the dosage necessary to cause lethal tumor damage, said Smith. The radiotherapist's major clinical problem today, in his opinion, is to find chemotherapeutic agents which will widen that breach.

Any form of irradiation, he said, is futile against widespread cancer, except for the temporary relief of symptoms, and then conventional X-ray therapy will bring the desired results. Leukemia and Hodgkin's disease are outside the cobalt realm, he stated.

## Cancer Morbidity Studies Test Etiological Theories

Although the incidence rate for all forms of cancer is almost identical for each sex, men run a 60 percent greater risk than women of developing common forms of cancer, except malignancies of the breast and genital organs, reported Harold F. Dorn, Ph.D., chief of the Office of Biometry at the National Institutes of Health.

However, until age 50 is reached, the incidence of cancer of the reproductive system among females exceeds the incidence of all forms of cancer among men, he said, using data from morbidity surveys conducted by the National Cancer Institute in selected urban areas of the United States in 1947 and 1948. The rates were adjusted for age to the total population of the country in April 1950.

Nearly one-half of all cancers among women originate in the breast or genital organs, he continued. In contrast, only 1 in 8, or 12 out of every 100 males who develop a malignant neoplasm, will have cancer of the genital organs or breast.

All other common forms of cancer occur more frequently among males than females, he stated. Excluding malignancies of the reproductive system, the incidence rate per 100,000 population becomes 290 for men and 181 for women.

### *Use for Etiology*

Dorn presented these statistics as an example of the use of morbidity data in the study of disease causation. Epidemiology is one of the tools used in etiology, he explained. The first step in the epidemiological process is an accurate description of the way a disease manifests itself in different population groups and subgroups and environmental situations.

The principal objective, he said, is to collect morbidity data for the purpose of formulating a hypothesis about causation, since the facts take on meaning only after they are organized and related to some theory. For instance, the fact that males are more likely to develop any form of cancer, except malignancy of the reproductive organs, suggests that they are more susceptible to cancer than females or that as a group they are more exposed to environmental carcinogenic agents.

Morbidity data, he continued, support the belief held by clinicians in the dependence of breast cancer development on the functioning of the endocrine system. Physiological changes associated with menopause, possibly hormonal in origin, temporarily slow up the rapid rate of increase in the incidence of breast cancer that is found prior to this age period. The strength of the association varies among different population groups and appears to be more marked among single women, according to Dorn.

### *Cervical Cancer*

For many years, Dorn said, clinicians have reported that cancer of the uterus was much less common among Jewish than among non-Jewish women and that cancer of the cervix uteri was exceedingly

rare, almost nonexistent, some thought. Preliminary results of comparative morbidity studies in Israel and New York City showed that the incidence of uterine cancer among Jewish women in Israel is less than one-half that among white women in the United States, Dorn reported. The incidence of corpus cancer is approximately the same for both groups, but cervical cancer was found about one-sixth as frequently among the Jewish women as among white women in this country.

The last finding indicates, he said, that cervical cancer, although infrequent, is far from rare among Jewish women. The difference between Jewish and non-Jewish incidence of all varieties of female genital cancer is real but not as great as formerly thought. Moreover, important variations in the incidence of genital cancer, he went on to say, were found within the Jewish population itself, which suggests that existing etiological theories may need to be examined and tested.

Dorn gave these examples to illustrate the epidemiological contribution to etiology. This, with knowledge gained from clinical experience and animal experimentation, can be components of hypotheses of causation, which must be tested by new clinical and epidemiological studies.

## Recognition of Symptoms May Delay Diagnosis

Do cancer education programs which spread a knowledge of symptoms cause the very thing they are trying to avoid—a failure to have the disease diagnosed in its earliest and usually most curable stage?

Consideration of this question is suggested to the Nation's health departments by Rose K. Goldsen, Ph.D., research associate in the Cornell University department of sociology and anthropology.

Goldsen believes that an ability to recognize the signs of cancer increases the anxiety of chronic worriers about the disease and makes them delay any possible confirmation of their fears. Cancer knowledge has its desired effect only on persons who, aside from concern over a definite symptom, aren't particularly anxious about malignancy, she said. The appearance of a danger signal sends them to a physician immediately.

However, in Goldsen's opinion, familiarity with cancer symptoms isn't the deciding factor in early or late diagnosis. Good general medical habits seem much more important, she stated. People at all levels of cancer knowledge are much less likely to neglect possible signs of malignancy if they habitually consult a physician as soon as they become aware of the symptom of any disease.

Goldsen based these conclusions on a study conducted in 1951 and 1952 by Cornell University's social science research center under the sponsorship of the division of medical services of the New York State Department of Health. Interviews were held with 727 persons who visited tumor clinics and cancer detection centers for the diagnosis of conditions which might be cancer symptoms. Individuals who had postponed an investigation of their symptoms for 3 months or more were classified as delayers and were contrasted with people who had gone for an immediate checkup.

### *Major Finding*

The major finding was that delay in seeking diagnosis for an observed danger signal of cancer is a special case of chronic patient delay, Goldsen reported. Reaction isn't governed primarily by the implications of this particular symptom, but by the sociomedical habits, attitudes, and practices of a lifetime. Goldsen said that over half the patients who admitted that they had put off a needed medical examination in the past also postponed their visits to the tumor clinic. Only 15 percent of those who did not admit earlier procrastination were delayers in seeking cancer diagnosis.

Another finding, confirmed by other investigators, was that an inconspicuous cancer symptom brings persons in for diagnosis more quickly than an obvious one. This finding is one aspect of the relationship between reaction to cancer signs and good general medical habits, said Goldsen. The likelihood of extreme diagnostic delay is more than tripled if individuals who customarily postpone any medical examination or treatment notice a very obvious symptom, she continued. The chances that such a person will be a delayer are 52 in 100. On the other hand, the study found that when a person with good medical habits becomes aware of a hidden sign, the chances of delay are only 15 in 100.

### *Additional Findings*

Other factors in delay include self-diagnosis and a suspicion of cancer in the past. Also, persons who feared their condition might be "something serious" were less likely to delay diagnosis than those who diagnosed the symptom differently. Goldsen also reported that if a person had feared cancer in the past and found his suspicion unjustified, he was less likely to seek professional examination for a new symptom or a recurring one. This didn't apply, however, to persons who usually see a physician for any symptom.

Goldsen didn't find that cost considerations have much influence on delay. She did, however, find a link between delay in seeking professional advice and reluctance to discuss the cancer sign with everyday associates. Diagnosis was deferred by 45 percent of these reticent persons, she said, whereas only 29 percent of the less reserved were delayers.

Other factors influencing deferral are residence in rural areas and low educational and economic status, Goldsen reported. Indifference to one's unemployment also produces delay.

But the patient's general medical habits will either minimize or intensify all other factors. In Goldsen's

opinion, the problem of cancer delay should be approached by public health educators, not by stressing the knowledge of cancer signals, but by emphasizing the need for prompt medical response to the symptom of any disease.

## Public Cancer Awareness Brought Wider Attack

The American Cancer Society's public education program—the reason for which the organization was formed in 1913—succeeded so well that cancer consciousness among laymen increased more rapidly after that date than the ability of physicians to recognize tumors smaller than they had been seeing, said Charles S. Cameron, M.D., the society's vice president and medical and scientific director.

As people learned more about malignancy, he continued, the dangerous period of delay before diagnosis was reduced; diagnosis became more difficult for physicians, and the need for a program of professional education became apparent.

Greater public awareness of cancer, he said, also meant increased demands on clinical services, called for an expansion in medical social services, and showed a need for nursing care of patients in their homes.

### *Broadened Program*

Services of this kind could not be offered directly by the society, Cameron said, but existing professional agencies, such as clinics and nursing services, could be encouraged by financial aid, and new professional activities could be inaugurated by subsidies from society funds. Its present program of professional education, for instance, includes—in addition to publications and cancer seminars—fellowship grants for formal postgraduate training in cancer diagnosis and treatment.

The development of cancer clinics, where complex problems of cancer diagnosis and case management are supervised by relatively small staffs, is another example of ACS efforts to meet increased demands for cancer services, according to Cameron. The society, he said, recommended the establishment of these clinics in 1929. The American College of Surgeons was invited to provide standards for the clinics' operation and certify those which qualified. There are now over 600 cancer clinics in the country, Cameron reported, and about two-thirds of them have been or are now being assisted by society funds.

### *Patient Services*

The service program is conducted at the local level by the society's divisions and units, within the limits of broad national policies adapted to local needs, the speaker continued. Over 2,000 information centers are available to help the cancer patient and his family. Drugs, medication, and dressings may be provided, he said, and more than 250 articles of sickroom equipment, such as hospital beds or wheelchairs, may be loaned to needy patients.

### *Research Grants*

In 1944, the society was reorganized and its base of activity broadened to include the support of basic and clinical cancer research, Cameron reported. In 1953, it supported 283 specific projects in 111 institutions and 41 mass, or institutionwide, grants to 41 laboratories and universities.

# Childhood Accident Prevention . . .

*Epidemiological studies of accidents among children to learn more about how, where, when accidents occur are urged as a basis for effective prevention programs. The results of one such study are reported. Other approaches to childhood accident prevention discussed include Chicago's poisoning control program and New Jersey's experiment in mass safety education.*

## Proposes Dynamic Program Against Child Accidents

An epidemiological approach to the prevention of children's accidents, accompanied by a dynamic and continuous safety program, was urged by Ross A. McFarland, Ph.D., associate professor of industrial hygiene, Harvard School of Public Health.

Pointing out that 15 percent of all accidental deaths occur among children under 15, McFarland urged parents, educators, physicians and others to cooperate in education and training efforts and to help modify emotional responses in children that may contribute to accident proneness.

McFarland held that accidental injuries and deaths follow some of the same biological laws as do disease processes and are amenable to controlled experimental studies, epidemiological surveys, and statistical analysis. Chief advantage of the epidemiological approach, he stated, stems from complex investigation of multiple causation.

Accident reduction may be accomplished through attention to the analysis of interaction of forces having to do with the host, the agent, and the environment. Prevention programs should begin with attempting

to control or modify those characteristics of the child which have been found to be important in causing accidents, he indicated.

### *Accident Data*

Such a program, McFarland stated, should begin with data on children's accidents: Who had them? When? Where? How did they occur? What were the circumstances? What characteristics of the child contributed to the accident? What behavioral indexes identify the child as one who may be unusually susceptible to accidents? What is the influence of other variables such as emotional upsets, feelings of rejection and nonacceptance, desire for parental attention, fatigue? What is the role of diet and blood sugar levels?

McFarland pointed out that reducing children's accidents through attention to the agent can be accomplished by isolating the host from the agent and reducing the virulence of the agent. Analysis will show that certain types of agents are involved in children's accidents more frequently than others, he said. These shift in emphasis with advance in age. He cited kerosene, lead poisoning, strangulation, and flammable clothing as examples.

Training in the recognition and avoidance of hazardous situations becomes especially important as the children become older, he said, pointing out that safety education should aim at safe practices without unduly restricting the natural proclivities of the child. Another approach toward reducing hazards calls for engineering and designing of equipment used by children, keeping in mind the age group for which equipment is intended. McFarland mentioned the design of harnesses and sleeping gear for infants as a case in point.

### *Control Bases*

Further analysis of accidents within the places they occur, by agent, type of accident and type of activity at the time of the accident, yields specific clues as to the role of environmental factors and affords control bases.

Referring to the icebox deaths in the United States, McFarland pointed out that there are no reliable data on the frequency of these accidents. He stated, however, that these accidents afford a clear example of accidents which can be prevented through environmental control, either through the design of equipment for safety—doors which can be opened from the inside—or through modification of existing hazards by removing doors from discarded boxes.

The control of social forces which influence the incidence of accidents appears to lie in the provinces of educational and emotional hygiene, whether applied to parent-child relationships or to the social climate of play or school groups, McFarland concluded.

## Epidemiological Patterns Revealed in N. Y. Study

At least 92 percent of 120 fatal accidents in 1953–54 among children under 6 years of age could have been prevented, according to an epidemiological study made by the New York City Department of Health.

Reporting on the study were: Harold Jacobziner, M.D., assistant commissioner, maternal and child health services; Patricia I. Heely, director, bureau of public health nursing; and Herbert Rich, senior statistician, bureau of records and statistics.

Pointing out that effective accident prevention programs must be based on facts concerning accident causation, they emphasized the need for employing epidemiological techniques in this field. Accidents follow a distinct epidemiological pattern, they declared, maintaining that the epidemiological approach should be as effective in controlling accidents as it has been in combating many infectious diseases.

In the New York study, Jacobziner and his associates specified, home visits were made by public health nurses to find out how, where, when, and to whom accidents occurs. They reported the following "unmistakable facts" from the study:

1. The highest incidence of fatal accidents was in children under 1 year of age, and the most frequent cause was so-called mechanical suffocation (see table).

2. Falls caused the second largest number of accidental deaths. They

**New York City Department of Health accident fatality study: cause of accident by sex, race, and age**

| Cause of accident | Total | White | | | Nonwhite | | | Age in years | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | Total | Male | Female | Under 1 | 1 | 2 | 3 | 4 | 5 |
| Traffic | 27 | 22 | 19 | 3 | 5 | 5 | 0 | 1 | 1 | 4 | 10 | 4 | 7 |
| Poisoning | 3 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| Fall | 28 | 20 | 10 | 10 | 8 | 5 | 3 | 6 | 5 | 7 | 3 | 4 | 3 |
| Burns | 17 | 9 | 4 | 5 | 8 | 5 | 3 | 5 | 2 | 2 | 4 | 3 | 1 |
| Suffocation | 36 | 27 | 12 | 15 | 9 | 6 | 3 | 29 | 5 | 1 | 0 | 1 | 0 |
| Submersion | 6 | 6 | 5 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 1 |
| Other | 3 | 3 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Total | 120 | 88 | 51 | 37 | 32 | 22 | 10 | 43 | 18 | 15 | 19 | 13 | 12 |

were most frequent in the early ages, from less than 1 year to 3 years, and during the summer months.

3. Traffic accidents were most frequent at the active ages.

4. Completely without adult supervision when the accident occurred were 62.5 percent of the children.

5. A definite correlation was found between incidence of accidents and socioeconomic level of the family, the incidence being higher in the underprivileged areas.

6. Accidents were more common among boys than among girls and among nonwhite children than among white. (Twenty-six percent of the accidents occurred in the nonwhite population, but the nonwhite population is only 16 percent of the total population.)

7. Only five children had a definite history of previous accidents, indicating that "repeatism" is probably not established as a pattern at ages under 6 years.

The study also investigated handicapping conditions of the child and emotional and mental disorders of the parents as possible predisposing factors, but the evidence was inconclusive, they reported.

### *Public Health Nurse's Role*

In the opinion of Jacobziner and his associates, the public health nurse is the most logical choice to make home visits for a study of this type. Their reasons were these: She has intimate knowledge of the area involved and its people; she has had training and experience in establishing easy liaison and rapport with families; she can use the home visit for general public health instruction and guidance, as well as accident investigation.

## Poison Control Program Launched in Chicago

A poisoning control program, designed particularly to aid children who accidently swallow household substances that may be poisonous, has been in successful operation in Chicago for over 10 months, according to Edward Press, M.D., M.P.H., and Robert B. Mellins, M.D.

Dr. Press is chairman of the Chicago Poisoning Control Committee and is also associate director of the division of services for crippled children, University of Illinois. Dr. Mellins is an epidemologist at the Communicable Disease Center, Public Health Service, on loan to the Chicago Board of Health.

The Chicago program is the first of its kind in the country, Press and Mellins reported. Centers in Boston, Cincinnati, Dallas, New York City, Phoenix, and Washington, D. C., have begun operating or are ready to start, they said. The Chicago group will act as a central agency for the collection and interchange of information.

### *Program Activity*

The Chicago program coordinates the efforts and resources of 20 hospitals, 5 medical schools, 4 full-time health departments, and others in a centrally guided plan for the treatment and prevention of accidental poisoning.

Press and Mellins stressed the importance of a looseleaf reference guide to the toxic constituents of thousands of household substances. The guide also outlines recommended treatments for patients who accidently swallow any of these substances. It is made available to individuals and institutions affiliated with the program. Physicians in the emergency rooms of hospitals are free to modify the suggested treatments in accordance with their own best judgment.

The data on all cases treated, including the material swallowed, the major signs and symptoms, the treatment, and the results, are sent to the Chicago Board of Health on a form specifically developed for the program. These reports are analyzed and then summarized, Press and Mellins said, and the information is reported periodically to participating centers.

Members of the health department make home visits or telephone calls, or both, to the families of children treated under this program. The visits are made primarily to help correct the conditions that led to the accidental swallowing of poison, but they also help to complete information on the type and amount of poison swallowed and on results of treatment. These contacts, they said, afford an opportunity to recommend general public health measures to the family and to leave home-safety checklists.

### *Program Results*

In the 10 months of the program's operation, 375 patients have been treated for swallowing a variety of substances—rat poison, kerosene, turpentine, insecticides, bleach, and lye, they reported. Only one death occurred.

Press and Mellins believe home visits to be effective in alerting the public to the danger of home accidents. Although admittedly a subjective evaluation, they felt that 131 of 147 home visits resulted in corrective measures that may prevent future accidents.

## Fear Used to Educate May Arouse Anxieties

When ought fear to be used to induce a population to adopt healthy practices?

Paul V. Lemkau, M.D., Johns Hopkins University School of Hygiene and Public Health, in his discussion of safety education without fear, stated that only when medicine has something to offer in the way of prevention should fear be used to motivate.

"When there is no technique available, when knowledge on which to base action does not exist, fear seems a weapon that has its dangers for the mental health of the people," he said, pointing out that fear was all right to use in typhoid fever campaigns since the disease can be stamped out. But he doubted the value of its use in

campaigns in which research is the only escape that can be offered to the anxieties of the populace.

Lemkau differentiated between anxiety and fear. Healthy fear, he said, of a dangerous situation about which something may be done may reduce its dangers. He declared that accidents are predictable events and to label them as accidents is a semantic error.

"Were accidents really accidents, we could have no preventive program," he said. "It is because they are events that are to some extent predictable, that we can analyze the various factors entering into the determination of their predictability and do something about them. Such analysis produces understanding and has the effect of reducing anxiety and healthy fear since the dangerous situation can then be better controlled," he said.

Accident prevention as a public health endeavor is fortunate in that the mechanics of accidents can be known, he continued. The cause and effect relationships are easily grasped, the factors of predictability offer the opportunity to reduce both fear and anxiety through their modification, and the fact that most people want to reduce accidents, at least consciously, makes the atmosphere favorable to accident prevention.

## An Experiment in Safety—The New Jersey Project

Because home accidents among young children warrant special attention, New Jersey undertook an experiment in mass safety education during the spring of 1954.

By investigating the judgment and attitudes of adults in relation to these accidents, a new approach was made toward translating already existing knowledge into preventive action, according to Renee Zindwer, M.D., M.P.H., chief, bureau of maternal and child health, New Jersey State Department of Health.

Zindwer described the project, in which approximately 40,000 persons participated and all local health units cooperated. She reported:

Preceded by an intensive campaign in which 1,191 local PTA units were alerted, a multiple-choice questionnaire was distributed to a 10-percent sample of parent-teacher membership throughout the State. Approximately 83 percent (25,000) of the questionnaires were returned.

The questionnaire was developed with the assistance of the APHA professional examination service. Its 16 questions theoretically involve the respondents in situations common to the home and which are potentially hazardous to a small child. Pretesting demonstrated that the questionnaire was a powerful health education tool because people reacted emotionally to the extent that they were eager to debate the issues presented (see sample question).

Distribution of the questionnaire was augmented by local radio and newspaper publicity. A Rutgers University radio forum on child safety was rebroadcast over 17 radio stations. Eighty-three articles and nine editorials appeared in 55 newspapers.

Followup of the questionnaire so far has consisted in its discussion at PTA meetings, publication of the preferred answers with reasons for their choice in the monthly publication of the State Parent-Teacher Congress, and similar publication of one question a week in the form of a child safety quiz in 28 newspapers. Similar radio coverage is planned.

Incomplete returns from an evaluation questionnaire sent to the various PTA chairmen indicates that local and county safety programs are scheduled. Other groups desire the safety questions for discussion. Requests are being received for the tabulation of answers, still to be completed, as well as for additional educational materials. A more detailed evaluation will obtain information on how local PTA chapters received the project and what specific plans are being made for further educational activities.

The New Jersey State Department of Health, Medical Society, Parent-Teacher Congress, Safety Council, the American Academy of Pediatrics (State chapter), and the National Safety Council are sponsors. The health department's actual cash outlay was $300. Other costs have been borne by the sponsors, but the major cost was defrayed by the volunteer man-hours donated. The National Safety Council is doing the statistical processing.

### Sample Question

The Howards realize that children must not only be protected but should also begin to learn about possible dangers as soon as they can understand. They believe that they can best begin teaching their Johnny (18 months) the meaning of the word "hot" by:

1. Saying "hot" while allowing him to touch something just warm enough to startle him so that he will understand the word "hot" when used as a warning.
2. Saying "no, no, hot!" to him and pulling him away each time he approaches any hot object such as a heater, a stove, or a heated iron.
3. Repeating the word "hot" and spanking him whenever he gets dangerously near a hot object which may injure him.
4. Demonstrating the meaning themselves by pretending to touch a hot object quickly and then exclaiming "ouch, ouch, hot!"

# Birth Certificate Data . . .

*Of interest to consumers of information obtained from birth records are the experiment in improving the quality of vital statistics which is now under way in several States, and the problem of inaccurate reporting which one health department found when it surveyed current obstetric practice in the community.*

## Vital Statistics Methods Important to Consumers

Changes in the methods of producing national vital statistics are important from the consumers' viewpoint as well as the producers', declared Howard West, M.P.H., chief of the biostatistics and health education division, District of Columbia Department of Public Health.

Under new procedures, several States are coding birth certificates and furnishing punched cards for tabulation by the Federal Government. West called this experiment "the most far-reaching and fundamental step" thus far to speed production and to cut costs, but he indicated that it may create problems for consumers of the data.

The selection of items that should be included on the punched cards previously was the responsibility of the National Office of Vital Statistics. This function will be increasingly shared with the States, West noted. Whether in the long run such joint consideration will benefit consumers cannot be answered now, he commented. Other questions relate to whether comparability will be maintained in interpretation, in classification, and in the carrying out of the numerous other statistical processes.

West asserted that a quality control procedure for the State-prepared cards would appear to be basic. He warned that selection of a State's birth records for one month as a sample for quality control would not be adequate to discover significant errors or provide means for their correction. For this reason and to facilitate special studies by the NOVS, he indicated that copies of all the records should be made available.

### *State Preparation of Tabulations*

West also urged consideration of the gains and losses to the data that can be anticipated if States prepare birth tabulations for use in producing national statistics.

He suggested two possible gains: earlier publication of national statistics, if all States tabulate simultaneously and maintain the schedule; and improvement in the quality of State staffs and in the caliber of State vital statistics activities. On the debit side he noted these problems: quality control, rigidity of tabulations, and lack of data to satisfy unanticipated needs for national statistics.

## Study Shows Inaccuracy Of D. C. Birth Certificates

Problems of under-reporting and over-reporting on birth certificates handicap the District of Columbia's obtaining a true picture of its current obstetric practice.

This was the reaction of Ella Oppenheimer, M.D., director of the bureau of maternal and child health, District of Columbia Department of Public Health, after a 1952 survey of birth certificates and matching hospital records revealed these chief deficiencies. The hospital records were assumed to be correct.

As part of a more detailed study to improve standards of maternity care, the investigation of matching records was devised to test the adequacy or accuracy of 24 items on the official birth certificates.

The selected items, some of which appeared on a detachable medical information supplement to the certificate, included: length of gestation, birth weight, type of delivery, need for artificial respiration of the infant, complications of pregnancy and labor, duration of labor, and the occurrence of congenital malformations and birth injury.

Birth weight, Oppenheimer said, was the only item reported with 98 percent completeness and accuracy. Length of gestation was found grossly inaccurate, with an extraordinary concentration of births in the 40-week category—76 percent as compared with 19 percent on comparable hospital records.

In one hospital with a study sample of 148 births, none was specified on the birth certificate as requiring artificial respiration, whereas the medical records showed 29 required it, she reported.

Oppenheimer said the health department can correct incompleteness of response by a conscientious inquiry into the reasons for such deficiencies. Since the reporting of this information is required by law, failure to comply cannot be well defended by the hospital or physician, she declared.

A program of enforcement could help, she said. Better cooperation, she added, can be expected from physicians if the reporting is simplified, if it is known that the data reported are being used, and if the value of these data is demonstrated through the dissemination of periodic reports of the findings.

Inaccuracy of response is a more difficult problem, demanding careful revision of the wording of items, as well as orientation in the meaning of the terms employed, she continued. The medical information requested on the birth certificate should be such that it can be reasonably obtained by the hospital staff

and appears to have relevance to the current problems of maternal hygiene.

The medical supplement to the birth certificate must not be permitted to become a fixed part of this vital record in terms of its contents, Oppenheimer concluded. As information is obtained, and a given problem clarified, it may be appropriate to delete the item. Furthermore, newly developing problems, or ones demanding a fresh inquiry, may call for the addition of new items.

# Workers' Compensation Plans . . .

*Indicating a need for cooperation by management, labor, and compensation boards, an otologist suggests steps to meet the problem of occupational hearing loss. Reports from the United States, Canada, and Great Britain discuss workmen's compensation programs—benefits, costs, and recommendations for improvements.*

## Suggests Program Against Industrial Hearing Loss

A constructive approach to the problem of occupational deafness, Abraham I. Goldner, M.D., a Flushing, N. Y., otologist, said, will avert the needless sacrifice of hearing ability provided that full cooperation is given by management, labor, and compensation boards.

Goldner, chief of Flushing Hospital's audiological clinic, reported that metal, pneumatic tools, spinning and weaving, aviation, telephone, rail transportation, repair shops, and similar industries are apt to have a noise hazard.

The bulk of occupational deafness exists at a subclinical level and is generally discovered, he observed, by virtue of an accident, superimposed pathology, routine audiogram, or a concerted group drive to obtain compensation.

### *Full Cooperation*

Industry, he stated, must recognize that a health problem exists. It is his belief that industry must cooperate with and financially support the enterprises now seeking further information about occupational deafness. Labor should avoid adamant attitudes and seek adoption of measures based on scientific accuracy rather than economic expediency.

Administrators of workmen's compensation laws and legislators, he noted, should be receptive to methods of cushioning severe financial blows. He believes they should also support research designed to lessen the acoustic hazard and facilitate the accurate evaluation of hearing loss and the proper determination of its cause.

All must recognize, he said, the existence in the population at large of a vast reservoir of undetected and unsuspected hearing impairments of various degree and cause. Only a careful hearing examination, including the audiometric evaluation, will demonstrate this loss, he said.

In Goldner's opinion, audiometric examinations should be part of the preemployment physical examination. The preemployment audiogram will make possible the hiring of workers with damaged ear drums and middle ear diseases, conductive deafness, established occupational deafness, and the elderly who exhibit a higher degree of hearing loss than the younger workers. Industry can benefit from their skills and still safeguard its risk by giving periodic hearing rechecks, he explained.

The regulation of hours of exposure to excessive noise, with provision for periods of recovery of the inner ear, the elimination of confined spaces, the use of ear protectors, the elimination of vibration in machinery are all important features of a program designed to eliminate occupational deafness, he said.

## Industrial Injuries Plan In Great Britain

In Great Britain, the worker's compensation for an industrial disablement is now based on the degree of loss of physical or mental faculty and not on loss of earnings.

Disablement assessment by medical rather than economic criteria and other features of Great Britain's insurance system covering industrial injuries, which replaced the national workmen's compensation procedures in 1948, were described by Arthur Massey, M.D., D.P.H., chief medical officer of the Ministry of Pensions and National Insurance, London, England.

### *Supplements Wages*

Under the new plan, Massey reported, a beneficiary may get an industrial disability pension while earning as much as he can. It follows, he said, that the pensioner has no financial incentive to refrain from working at full capacity.

Three types of benefits—industrial injury, disablement, and death—are available to eligible claimants among the 20½ million employed persons covered by the Industrial Injuries Act, Massey reported. He described the system as follows:

An injury benefit is payable up to 26 weeks to a person incapacitated by an accident or an occupational

disease. A disablement benefit is payable if incapacity for work continues after the injury benefit stops.

The usual disability benefit rate ranges from 11 shillings a week for a 20-percent disablement to 55 shillings for a 100-percent disability. A lump sum payment is made to persons less than 20-percent disabled. Various supplements, such as an unemployability supplement and allowances for constant attendance, special hardship, and hospital treatment, may also be awarded.

First, the local insurance office, one of the approximate thousand located throughout the country, decides whether an accident has arisen out of and during the course of employment and, on the basis of a medical certificate, whether it has caused incapacity for work. Most disease cases are referred for diagnosis to a local examining medical practitioner.

After the local insurance officer has admitted the claim, general medical boards at more than 100 strategically located centers assess the degree of disablement or loss of faculty caused by the occupational accident or disease (with the exception of pneumoconiosis, byssinosis, and tuberculosis).

### *Special Assessment*

Tuberculosis, the first disease really common in the general population to be covered, is diagnosed by a chest specialist. Scheduled occupations consist mainly of medical treatment or nursing of tuberculosis patients, and ancillary hospital work, and research, laboratory work, or autopsies in connection with tuberculosis.

Pneumoconiosis and byssinosis are also considered separately, and the successful claimant proceeds direct to disablement benefit without antecedent injury benefit since the incapacity occurs in the late stages.

Special medical boards at nine main centers, accessible to such industries as mining, pottery, metal working, and cotton spinning, verify by clinical examination a preliminary pneumoconiosis or byssinosis diagnosis and assess the amount of disability.

Pneumoconiosis is now compensated down to 1 percent of disablement. The limit before 1954 was 5 percent. In a recent development, a benefit may be allowed for pneumoconiosis contracted in an unscheduled dusty occupation.

Admission of byssinosis claims is predicated on two conditions: at least 20 years of employment in a scheduled occupation and permanent disablement amounting to 50 percent or more. Prior to 1948, a 100-percent disablement was required. Coverage, formerly applying only to raw cotton workers, has been extended to certain categories of waste cotton workers.

Diseases added to the schedule since 1948, in addition to tuberculosis, are beryllium poisoning; carcinoma of the mucous membrane of the nose or associated air sinuses and primary carcinoma of a bronchus or of a lung occurring in nickel workers; and papilloma of the bladder in certain chemical workers. There are now 39 occupational diseases on the schedule.

The industrial injuries fund is formed by weekly contributions from employers and insured persons. To this is added an exchequer payment at the annual rate of one-fifth of the sum of the combined contribution.

## Rehabilitation Needs Link To Compensation Services

The most promising aspect of State workmen's compensation programs is rehabilitation, declared Jerome Pollack, B.S., program consultant, social security department, CIO-United Automobile Workers. However, he said, rehabilitation services are not included as part of workmen's compensation in most States, and they are not well coordinated with services provided under the workmen's compensation program.

It has been estimated that in the United States only 3 percent of the workers injured on the job are receiving the types of services they need to rehabilitate them, Pollack stated.

According to Pollack, the extent of medical care programs is far greater than was anticipated when the workmen's compensation laws were written. Four out of five civilian employees are now entitled to medical care for work-connected injuries, he said, and the cost of the workmen's compensation program is about 3 percent of all private expenditures for medical service and about 17 percent of the amount paid by voluntary insurance plans. Care for occupational injuries is not provided by these plans, Pollack said, and as they become more comprehensive, greater coordination with workmen's compensation will be needed.

Under present workmen's compensation programs, the extent and amount of medical care are limited by statute in many States, and rehabilitation frequently is not possible within these limits, Pollack stated.

Early legislation did not stipulate the quality of medical care to be provided injured workers and often limited fees to the amount charged "in the same community for similar treatment of injured persons of a like standard of living." This criterion is subject to a variety of interpretations and does not always result in the best care for the patient, Pollack said. He stated that in all but nine States the employer or the insurance company designates the physician.

### *Rehabilitation Services*

In most States, rehabilitation is not sufficiently coordinated with the Federal-State vocational rehabilitation programs, Pollack stated. Personnel and facilities are scarce, and patients must often travel long distances to reach the few rehabilitation facilities that are available. Also, he maintained, new incentives are needed to encourage interest in rehabilitation; most employees are not sure of its advantages and many

prefer a cash award or a permanent pension.

Pollack recommended that a study be made to determine how to assure workers of competent and impartial care. He suggested that minimum standards for handling medical care problems be established for insurance companies, State funds, and employers' medical departments, and that the function of the industrial board or commission in medical care be explored.

He also recommended that rehabilitation be made a benefit of workmen's compensation and available to all who need it.

## Workmen's Benefits High, Employer's Costs Low

Ontario's 40-year experience with a workmen's compensation program has proved so satisfactory to employers, workmen, and the medical profession that it has been copied by every other Canadian Province.

Authors of this statement and of a description of the Canadian Province's program in relation to quality of medical care were B. H. G. Curry, M.D., chief medical officer of the Ontario Workmen's Compensation Board; J. E. F. Hastings, M.D., D.P.H., research fellow, and G. H. Hatcher, M.D., D.P.H., assistant professor, both of the University of Toronto School of Hygiene; and Mary A. Ross, M.A., Ph.D., medical statistician of the Ontario Department of Health.

### *Program Features*

In addition to the exclusion of the law courts and private insurance companies from its administration, the plan features comprehensive medical care provided by private medical practitioners on a fee-for-service basis under the supervision of the three-member Ontario Workmen's Compensation Board, they reported. At present the board, appointed by the government, is composed of a former employer, a former union representative, and a physician.

The board is the sole judicial and administrative authority for collecting premiums from employers, adjudicating and paying benefits to injured workmen and supervising complete medical care, including rehabilitation, they said.

The benefits were termed more generous and the costs to employers less, than in most American jurisdictions. This has been achieved without direct cost to the workmen or to the taxpayers, they said, since the complete costs are obtained by annual assessments from the employers.

In 1952, they reported, Ontario paid 75 percent of the employee's maximum earnings up to $4,000 a year, or $57.69 a week, for total disability from the first day of the accident, either as a lifetime pension or for the term of disability.

Since no money is spent on litigation or insurance company administrative costs and dividends, they pointed out, 89 cents of every $1 paid for workmen's compensation is spent on payments or medical benefits to workmen.

### *Medical Care*

Throughout the administration, they said, the pressure is on the injured workman and his employer to seek the medical care needed for an industrial illness or accident. It is the general policy to let the patient choose his own physician and to get remedial surgery in a general hospital.

The physician, the employer, and the employee each submits a notification of accident to the board. The physician also submits his accounts and details of care to the board and is paid on a fee-for-service schedule approximating the minimum recommended by the Provincial medical association.

The remuneration rate is high enough to keep the physician from being dissatisfied with care of compensation cases, they stated, and the quality of his services is also governed by the knowledge that the diagnosis and treatment are reported to the board and may be reviewed by other competent physicians.

To augment this care, they reported, the board maintains wards in several hospitals where problem cases may be brought for assessment and a special 518-bed medical rehabilitation center where physical medicine and work trials can be conducted.

Featured at the rehabilitation center, they reported, are conditions set up to simulate those of the workman's actual job, laying railroad track, for example. The patient must demonstrate that he is able to work a regular 6-hour day before he is discharged to full employment.

## Outlines New Guidelines For Compensation System

A set of operating guidelines for a "modern workmen's compensation system" which the Subcommittee on Industrial Relations of the American College of Surgeons feels essential for the attainment of the basic principles for the rehabilitation of the disabled worker was outlined by Alexander P. Aitken, M.D., chairman of the group.

On the subcommittee, Aitken said, were representatives from labor, insurance carriers, public health and vocational rehabilitation agencies, and the medical profession. He said they unanimously agreed on the report, the product of 4 years of study.

Some of the proposals outlined by Aitken can be put into effect only by changes in administrative rules and in the compensation laws.

The rehabilitation problem, Aitken said, is one of many facets. Although it is of direct concern to the medical profession, he said, the failure of labor, management, insurance carriers, administrators of compen-

sation laws to share equally and uphold their responsibilities "may be just as deleterious to the worker's welfare as the lack of medical care."

As for the physician, Aitken said, the responsibility for the injured workers does not end with the healing of the acute lesion. "It must continue," he said, "throughout the period of disability and must include not only competent aftercare treatment of the lesion itself, but also all complications whether medical, surgical, or psychological."

In the proposed set of principles, the subcommittee called for appointment of only experienced men as administrators and also for the creation of panels of impartial, medically qualified experts to establish the standards for medical rehabilitation services and to determine the causal relationship of injury or disease in contested cases.

Supervision of the care should be assigned to the compensation agencies in order to assure accuracy of diagnosis, competent care for as long as needed, vocational rehabilitation when indicated, and the maximum recovery possible before determination is made of permanent injury, according to the committee's report.

The committee urged review of existing practices to assess the need for modifying compensation laws so that continuous medical and rehabilitation care from date of injury or disability to maximal restoration would be assured. It also urged consideration and inclusion of family security provisions and that coverage be extended to all employees. It said that a broadening of the second injury provisions of compensation statutes would further encourage employment of physically handicapped workers.

# Child Health, Prematurity . . .

*The association between fetal factors and childhood disorders, the etiology of retrolental fibroplasia, the influence of socioeconomic status and of high altitudes on prematurity, transport of premature infants from hospital to center, and perinatal mortality are discussed in this series of papers.*

## Postulates a Continuum Of Reproductive Casualty

Abortions, stillbirths, and neonatal deaths are linked to a mother's pregnancy by a significant pattern of related factors that also influence cerebral palsy, epilepsy, mental deficiency, and certain behavior disorders in childhood.

Responsibility for these abnormal complications, in the opinion of Abraham M. Lilienfeld, M.D., M.P.H., Benjamin Pasamanick, M.D., and Martha Rogers, R.N., Sc.D., lies not in a single set of maternal and fetal factors but in a "continuum of reproductive casualty," extending from fetal deaths through a descending gradient of brain damage manifested as certain neuropsychiatric disorders. This philosophy provides a framework for refined research, they said.

Dr. Lilienfeld is chief, department of statistics and epidemiology at Roswell Park Memorial Institute, Buffalo. Until recently he was associated with Johns Hopkins School of Hygiene and Public Health, where Dr. Pasamanick is associate professor of public health administration and Dr. Rogers was a recent graduate student.

In reporting their fifth study on the association between maternal and fetal factors and various childhood disorders, they found the association to be greatest for stillbirths and neonatal deaths and least for behavior disorders. Contrary to any prevailing impression, they found no such relationship between pregnancy experience and speech disorders. This completely negative result among the other correlations eliminates the possible influence of an inadvertent bias, they said.

### *Overcome Complacency*

Lilienfeld and Pasamanick's method of study varied only slightly for each condition investigated. It consisted of selecting for each disorder a group of children that had been born in a given period within a particular geographic area. Data on the events that had occurred during the mother's pregnancy were obtained. The frequencies of complications of pregnancy, prematurity, obstetric, and neonatal difficulties were then compared with suitable controls. Routinely gathered health department and hospital data in Baltimore and New York State—usually birth certificates and hospital obstetrical records—were the chief record sources.

They said it is important to recognize the possible socioeconomic bias contained in the use of health department and clinic records as affecting interpretation of their findings. Such data, however, have great potentiality for other investigations, particularly those that provide hypotheses as a basis for further research in other types of diseases, they believe.

A possible influence of maternal age and birth order was suggested in the excess of older mothers with first births in the cerebral palsied group. They said that further investigation with a larger series of cases—there were 561—would be re-

quired to substantiate this observation.

Hope for prevention of handicapping childhood disorders lies in obtaining sufficient knowledge to prevent the various complications of pregnancy and other abnormalities, they said. Maternal and fetal factors are not the only causes of injury to the brain, they said. They implied that the state of the mother prior to conception may influence the outcome of pregnancy.

They also believe that a shift in emphasis to the underlying causes of maternal and fetal morbidity, as the next phase in maternal health planning, might prevent the continued complacency concerning the present low rates of maternal and infant mortality.

## Retrolental Fibroplasia And Oxygen Supply

Discussing the etiology of retrolental fibroplasia, Theodore H. Ingalls, M.D., associate professor of epidemiology, Harvard University School of Public Health, stated that progress being made in knowledge of the relationship between oxygen supply and fetal development implies a future advance in public health.

It also implies a relative control of the disease through an improved understanding not only of premature infants but of adults and of the conceptus before it is born, he said.

Reviewing recent research on hyperoxia and anoxia, Ingalls stated that the immediate advance that has been made is in preventive medicine.

Much has been done, he said, to dissipate the incongruities between the work of those who have been approaching hyaline membrane disease in the neonatal period and retrolental fibroplasia later in the first year of life as manifestations of hypoxia and those who have ascribed these conditions simply to hyperoxia, Ingalls stated. He likened the two groups to "engineers starting a tunnel from either end." The logical destination of both groups, he said, is the "common meeting ground of balanced oxygen supply; either extreme causes anoxic injury."

Hyperoxia at a steady concentration of 60–80 percent, by ultimately producing pulmonary irritation, exudate, and hypoxia, will expose a premature baby to serious risk of retrolental fibroplasia if he survives, Ingalls stated. If he dies, the indications are that the diagnosis at autopsy will be pulmonary hyaline membrane. In the human infant, hyaline membrane disease is apparently the counterpart of the acute hemorrhagic pulmonary edema or the more chronic hyaline exudate that can be produced experimentally in animals, he stated.

Although much of the basic work on hyperoxia and hypoxia has been done, much critically important research on balanced oxygen supply remains, Ingalls concluded. Control of the critical stresses encountered at either extreme of oxygen supply depends on avoiding or minimizing both anoxia and hyperoxia, he said.

## Links Socioeconomic Level To Premature Births

A 26-percent reduction could be expected in the number of babies born prematurely—those for whom mortality risk is greatest—if all the white mothers in Baltimore had the favorable prematurity experience of the 10 percent in the highest socioeconomic bracket, according to a study of birth records kept in that city during 1950 and 1951. However, the statistics indicate that even in the highest strata, as defined for this study, 5 percent of all births were premature.

The epidemiological project was reported by Rowland V. Rider, Sc.D., assistant professor, and Hilda Knobloch, M.D., research associate, of the School of Hygiene and Public Health, Johns Hopkins University, and Matthew Taback, Sc.D., director, bureau of statistics, Baltimore City Health Department.

### *Prevention Problem*

Two-thirds of infant deaths, they said, are estimated to occur among infants weighing 2,500 grams (5½ pounds) or less, although such premature infants constitute less than one-tenth of all births. Furthermore, they continued, there is increasing evidence that prematurity and its associated complications of pregnancy, labor, and delivery may increase the child's risk of retarded mental development and neurological disorder.

Understanding of cause must precede any effort at prevention, Rider and his associates said. Previous studies, they said, have indicated that socioeconomic status is a determinant of prematurity.

### *Method of Study*

In testing this theory, Rider and his associates limited their study to the white population since earlier work in Baltimore had shown that premature births are much more common among nonwhites. The race variation, they said, is thought to be due to economic differences, but they wished to avoid having their results complicated by the race factor.

The socioeconomic status of white mothers was estimated from their residence since this placed them in census tracts and these, in turn, had been divided into 10 economic levels on the basis of median rentals reported in the 1950 census. The births for which city records failed to give the mother's street address were excluded from the study.

Preliminary investigation, according to Rider and his colleagues, indicated that in the lower economic brackets proportionately more babies were born to mothers under 20 years of age and to mothers who already had four or more children. Since, they said, it is possible that these factors influence prematurity, the birth certificates which omitted information on maternal age and

birth order were also put aside, as were those showing plural births. This left 42,277 births remaining for study, Rider and his co-workers reported. Of this total, 27,979 were white and 14,298 were nonwhite.

*Results of Study*

They found that 6.8 percent of the white infants born singly and alive were premature. The frequency varied from 7.3 percent in the lowest socioeconomic tenth of the city to 5.1 in the highest. The differences between economic strata became even more apparent, they said, when the figures were adjusted for maternal age and birth order. The ratios then ran from 5.0 percent at the highest level to 7.6 at the lowest. Neither adjusted nor unadjusted figures, Rider and his associates reported, showed much variation among the lower four brackets.

## Incidence of Prematurity Higher at High Altitude

Studies of the effect of altitude upon birth weight have been prompted by the discovery that the incidence of premature babies (as determined by birth weight) for a high-altitude county in Colorado is three times the State average. Thus far the findings are not conclusive, according to the report by John A. Lichty, M.D., Rosalind Y. Ting, M.D., M.P.H., Paul D. Bruns, M.D., and Elizabeth Dyar, Ph.D.

Dr. Lichty, Dr. Ting, and Dr. Bruns are, respectively, associate professor of pediatrics, pediatric research fellow, and associate professor of gynecology and obstetrics, University of Colorado Medical School; Dr. Dyar is professor of nutrition and dean, School of Home Economics, Colorado A & M College.

Local physicians, they noted, have stated that many of the babies born in this county (Lake County) are small but are not prematurely born. Supporting this idea is the fact that neonatal mortality was only about twice the State average for the same period, 1949 through 1953, they indicated.

To test the theory that high altitude accounts for the high incidence of premature, or small, babies in Lake County (altitude, 10,000 to 11,000 feet), comparisons of birth weights of babies born there with birth weights of babies born elsewhere were made. Some of the data are shown in the table.

In each weight group, Lichty and his associates specified, the Lake County babies were about three-fourths of a pound smaller than babies born in Denver (altitude, 5,280 feet). The fact that the percentage distribution of weights for babies born in Cripple Creek, Colo. (altitude, 9,000 feet), is closer to the distribution for the Denver babies than to the distribution for Lake County babies, however, seems not to support the theory, they noted. But they considered the reliability of the Cripple Creek distribution questionable because of the small number of babies involved.

*Race and Diet*

Also investigated was the possibility that race is a factor in the high incidence of prematurity in Lake County, since about one-third of the county's population is "Spanish." Comparison of average birth weights of "Anglo" and "Spanish" infants in this county and in Denver revealed no significant difference between the two race groups, they stated. They suggested, however, that the factor of race be studied further.

Diet likewise seems not to be related to the prematurity situation, they indicated. A comparison of dietary intake of Lake County mothers of full-term babies with that of Lake County mothers of premature babies did not reveal any significant difference.

**Percentage distribution of birth weights**

| Birth weight in grams | United States [1] (percent) | Baltimore [2] (percent) | Denver [3] (percent) | Cripple Creek, Colo. [4] (percent) | Lake County, Colo. [5] (percent) |
|---|---|---|---|---|---|
| 1,000 or less | 0.5 | 0.6 | 0.7 | 0.4 | 0.9 |
| 1,001–1,500 | .6 | .7 | .8 | 1.6 | 3.3 |
| 1,501–2,000 | 1.4 | 1.8 | 1.9 | 5.3 | 13.7 |
| 2,001–2,500 | 4.9 | 5.8 | 8.3 | 10.6 | 30.4 |
| 2,501–3,000 | 18.1 | 23.3 | 27.4 | 31.4 | 32.2 |
| 3,001–3,500 | 37.7 | 39.4 | 40.8 | 39.6 | 17.2 |
| 3,501–4,000 | 27.1 | 21.8 | 16.7 | 9.0 | 2.4 |
| 4,001–4,500 | 7.7 | 5.5 | 3.0 | 2.0 | ---------- |
| 4,501 or over | 2.1 | 1.1 | .3 | ---------- | ---------- |

[1] Number of babies, 33,000.
[2] Number of babies, 9,523; altitude, sea level.
[3] Number of babies, 10,566; altitude, 5,280 feet.
[4] Number of babies, 244; altitude, 9,000 feet.
[5] Number of babies, 577; altitude 10,000 to 11,000 feet.

## Perinatal Mortality Rate Shows Areas of Need

The socioeconomic conditions of expectant mothers, their state of health, and the care they receive during pregnancy are, aside from obstetric services, the determining factors in death rates for infants during the first week of life and after 28 weeks of gestation, according to the implications of a study reported by three members of the New York City Department of Health. These periods of early life and late fetal existence are grouped under one classification—called perinatal—because similar conditions

may cause death at both stages, said Jean Pakter, M.D., chief, maternity and newborn division, Carl L. Erhardt, B.B.A., director, bureau of records and statistics, and Harold Jacobziner, M.D., assistant commissioner.

Recent years have seen marked progress in saving the lives of mothers and older infants, they reported, but the least improvement, shown by a comparatively slow decline in perinatal mortality rates, has been in bringing pregnancies to a successful conclusion. In New York City, where home deliveries are extremely rare, this is largely a hospital problem, they said.

The reported study analyzed New York City data for 1951 and 1952 to determine the perinatal death rates in individual hospitals and to discuss the factors, other than obstetric care, influencing the rates.

### *Hospital Population*

Pakter, Erhardt, and Jacobziner believed that the race, age, and parity of the patients and the extent of their prenatal care, among other factors of hospital population, are constant influencing factors. Race, they said, is largely influential since it reflects socioeconomic status. Mortality rates in the three categories of hospitals studied were quoted to support their contention.

A tabulation showed that more than 180,000 deliveries occur annually in 103 city hospitals. Approximately two-thirds of the mothers in this area are under private care, they said. The mothers are delivered either at proprietary hospitals—privately owned business enterprises open only to patients who pay the full cost of their care—or at voluntary hospitals which are nonprofit institutions with varying numbers of paying and nonpaying patients. One-third of the mothers, the study found, are delivered either at municipal hospitals, which largely provide free care, or in the public wards of voluntary hospitals.

Infant death rates, fetal death ratios, and perinatal mortality rates were found to be highest for municipal, lowest for proprietary, and median for the voluntary hospitals, they reported. The inference is clear, they said, that higher mortality rates are associated with hospitals caring for people of the lower socioeconomic groups.

### *Size and Location*

Two other factors were investigated for their possible effect on infant and fetal mortality—the size and location of hospitals. But these components appear to influence the rates only insofar as they reflect the background of the patients, they reported. Large municipal hospitals which cared for a great number of nonwhite patients showed significantly higher death rates than other large hospitals in the same category whose patients were mostly white.

The study showed that the aggregate perinatal mortality rate was found to be highest in Manhattan borough and lowest in Queens. They related this finding to the fact that 45 percent of the women delivered in Manhattan are service or nonpaying cases whereas in Queens the proportion of service cases is only 20 percent.

A number of other investigators were quoted in support of the thesis that medical care is not the whole answer and indicated that a relationship exists between infant and fetal death rates and the dietary and other prenatal care received by mothers.

### *Hospital Care Index*

Investigation is needed, they said, to determine the extent to which hospital perinatal mortality rates represent indexes of obstetric care. Any such evaluation, they continued, must allow for the extrinsic factors considered in this study. But even without this adjustment, they believe that the rates are the most useful means of focusing the attention of public health administrators on areas in need of assistance. For instance, they concluded, the New York City Department of Health intends to study closely those hospitals in which the perinatal rates exceed the city mean for their own institutional category.

## Proposes Plan to Speed Prematures to Centers

A simplified plan for speeding prematurely born infants from hospitals to regional premature centers was advanced by Edward H. Townsend, Jr., M.D., director of the Rochester Regional Premature Center of the Rochester, N.Y., General Hospital.

Townsend's proposal would cut at least half of the time it now takes to transport the premature infants to the center by shifting the burden of transport responsibility from the regional hospital service to the hospital of delivery.

The way Townsend sees it, the hospital of delivery would first call the premature service to see if the infant can be accommodated. Then, after approval, a nurse would take the baby in any available vehicle equipped with a Pragel carrier or portable incubator that can operate from an automobile electrical system. Thus precious time, crucial in this stage, would be saved. Waiting for the ambulance to arrive from the premature center, as far as 100 miles away, would be avoided.

The mortality rate among premature infants is maximal during the first 24 hours of life (57 percent) and 87 percent of the deaths attributable to prematurity occur during the first week of life, Townsend asserted. Hence, prematures should be moved before intervening complications dominate the picture, he maintained. Small hospitals, unable to spare nurses for transportation services, would have to solve this problem under the new plan.

Another advantage of the plan is that the prematures could be transported regardless of the time of delivery instead of waiting as is done now for daytime ambulance services from the regional center.

The Rochester Regional Premature Center serves a 10-county area in upstate New York, Townsend said. It was built by private funds but is operated with the cooperation and assistance of the bureau of maternal and child health of the New York State Department of Health.

Premature centers, whether urban, suburban, or rural, have prime responsibilities to the region they serve, Townsend said. First is the actual care of the premature infant, but of equal importance are the study and research of the problems of prematurity and the continual demonstration of optimal premature care; a premature center should serve as a station from which and to which physicians and nurses may travel to observe, to teach, and to improve the care of the prematures in the region served.

## Find Perinatal Deaths Equal Deaths to Age 40

In New York State in 1951 perinatal mortality, deaths occurring after the fifth month of pregnancy and before the second month after birth, equaled the number of deaths in the age group between 1 month and 1 day and the 40th birthday, according to Edward R. Schlesinger, M.D., associate director, division of medical services, and Norman C. Allaway, biostatistician, New York State Department of Health.

Fetal and newborn deaths are the major remaining mortality problem in the field of maternal and child health, they said. The trend toward concentration and narrowing of the problem of perinatal loss demonstrates the need for increased research and public health services for women who present a history of previous child loss, they asserted.

Comparison of the 1951 study with the study made in 1936 shows that relatively little progress has been made in reducing the rate of perinatal loss in the more vulnerable group of women, those who suffered previous child loss, they reported. No improvement can be demonstrated in the most vulnerable group of all, women with a history of loss of three or more previous children, they added.

Women who experienced perinatal loss were 2.7 times more likely to suffer loss in subsequent pregnancies than women without such loss, according to the 1951 study. In 1936 this figure was only 2.2, Schlesinger and his co-workers said. The expectation of loss in later pregnancies (see chart) increases sharply with the number of previous losses, they reported.

### *Comparing the Studies*

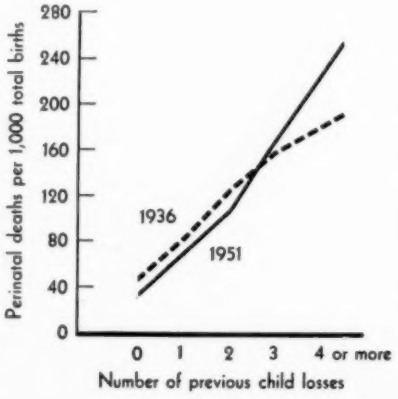
Comparison of the 1951 and 1936 studies showed the following:

The 1951 study included 106,344 births (fetal deaths and live births) as compared to 53,653 in 1936. In 1951, only 46 percent of the women had had only one previous child; in 1936, this figure was 38 percent. Only 7 percent of the 1951 group had had five or more children; in 1936, this figure was 18 percent. In 1951, 12 percent of the women had lost one previous child or more; in 1936, 24 percent had lost at least one child.

In 1951 mothers had a previous child loss rate of 68.0 per 1,000 total births; in 1936 the rate was 124.5. The fetal death rate was 16.6 per 1,000 total births as compared to the rate of 26.0 in 1936. Neonatal death rate in 1951 was 18.6 per 1,000 live births; in 1936 the rate was 30.4. The perinatal death rates in 1951 and 1936 were 34.9 and 55.6 per 1,000 total births.

In 1951, the perinatal death rates among children of mothers according to previous loss ranged from 29 among women with no previous loss to 253 among those with 4 or more previous losses. In 1936 the corresponding rates were 43 and 189.

**Perinatal death rates by number of previous child losses in the 1936 and 1951 studies in New York.**




## Tests Value of Services For Colorado Prematures

How many and what kind of illnesses do premature infants have during their first year?

What are the differences in the kind and amount of preventive illness services received by premature infants with less than 4 illnesses and those with "many" (4 or more)?

Could any of these differences be utilized in preventing illnesses in these children?

The answers to these questions were the objectives of a study reported by Georgia B. Perkins, M.D., M.P.H., assistant professor of preventive medicine and public health, University of Colorado School of Medicine, and regional medical director, Region VIII, Children's Bureau.

The study was based on a sample group of 144 premature infants admitted to the Premature Infant Center of Colorado General Hospital.

Perkins reported the following findings:

Of the group, 124 were alive at discharge.

The number of illnesses of the premature infants followed for 1 year (86) varied inversely with the length of medical supervision.

Seventy-three percent of the infants had few illnesses, and 27 percent had many illnesses.

Sixty percent of the illnesses were infectious in origin, and 70 percent

of these were of the respiratory-pulmonary system.

Fifty-two percent of the hospitalized and 65 percent of the nonhospitalized illnesses were potentially preventable.

The routine child health conference, the pediatric clinic, and the emergency room shared equally in the care of these illnesses.

Babies weighing 1,001 to 1,500 grams at birth had fewer illnesses than those weighing more or less. This suggests the possibility of re-evaluating discharge criteria.

Babies kept in the hospital for 41 days, or more, after birth were less likely to have many illnesses than those kept 40 days or less.

Analysis of the time of public health nurse visits suggests the possibility that these visits help prevent illness.

The highest percentage of those having many illnesses had no medical social service. Analysis of medical social service suggests a definite and direct relationship to illness prevention.

# Health in Foreign Countries . . .

*From Canada, Formosa, England, and Australia come reports concerning problems and programs in a variety of health and related fields: relationship of weight to health, nutrition, laboratory and radiological services, rehabilitation of derelict families, social-medical research, and zoonoses.*

## Show Vitamins Lacking In Ample Rice Diet

Chinese National Army troops stationed in Formosa received an abundance of calories from a predominantly rice diet, but were afflicted with vitamin deficiency disease that ranged from severe to mild, according to a study conducted in the spring of 1954.

Geoffrey W. Rake, M.B., and Wen-Tah Yang, M.D., respectively, research professor of microbiology in the department of medicine at the University of Pennsylvania and the deputy surgeon general of the Chinese National Army, said that parasitism was prevalent, but often in a relatively symptomless form.

The basic ration of cereal, soybeans, and oil was uniform for all troops, they said, but a system of local purchase caused the type and even the amount of animal protein and vegetables to vary among different units. In general, the diets were markedly deficient in fat, $B_2$, and calcium, and somewhat deficient in niacin and ascorbic acid. The principal vitamin deficiencies in the diet, they reported, were in riboflavin, vitamin A, and niacin.

### *Unexpected Finding*

Rake and Yang said that there was surprisingly little evidence of disability produced by ascorbic acid deficiency. They suggested that pyorrhea, very prevalent among the troops, might conceal lesser effects of this deficiency on the gums. The possibility that pyorrhea may itself be an indication of vitamin C (ascorbic acid) deficiency is more interesting, they continued, and said that this was observed in Denmark after World War II.

They found little beriberi or other disabilities which could clearly be ascribed to a lack of thiamine. Unusually severe retinitis which produced marked and more or less irreversible lowering of visual power was apparently not due to thiamine deficiency alone. Further investigation of the condition, which, they said, could be the result of combined deficiency in the type of diet described, was recommended.

### *Vicious Circle*

Rake and Yang believe that chronic undernutrition and vitamin deficiency predispose to chronic parasitism, all other things being equal. Certainly, they continued, parasitism predisposes to increased malnutrition. Hookworm infestation, for example, was as high as 34 percent among the Marines at Tsoying, where some of the nutritional studies were carried out. Anemia was prevalent in some units, they reported. In some cases it was macrocytic in character and probably due to the marked deficiency of $B_{12}$ and partial deficiency of folic acid. However, they said, hookworm infestation is undoubtedly also responsible. Most, if not all, the patients who had severe anemia harbored hookworms.

### *Recommendations*

Measures suggested by Rake and Yang for the improvement of general health conditions included an attempt to eliminate the intestinal worms by the use of a polyvalent vermifuge. Addition to the diet of deficient vitamins and other nutrients was also recommended.

## Canada Reports Nationwide Height-Weight Survey

For the first time in Canada, individual heights and weights can be compared with a true national average, according to L. Bradley Pett, M.D., Ph.D., chief of the nutrition division, Department of National Health and Welfare, Canada.

Tables, believed to be the first of their kind obtained by statistical sampling of the heights and weights of an entire population, have been compiled and will be available from the Department of National Health and Welfare.

"Weight relationships to health are among the most fundamental problems needing study at the present time," Pett said, and these data should provide a sounder basis than has been available heretofore for studying the effects of weight in aging and in the degenerative diseases.

Using the area stratification method, the Canadian study obtained height, weight, and age data for 22,000 Canadians in 1953. Remote areas as well as heavily populated regions are represented in the random sample.

Overweight is not the same thing as obesity or adiposity, Pett continued. Lack of clear definitions has resulted in actual misuse of these words, and when it becomes possible to differentiate these terms, greater understanding of the importance of diet and greater success in controlling degenerative diseases may result, he stated.

Muscular hypertrophy may result in increased weight, Pett said, whereas a moderate accumulation of fat may not do so, and therefore, in defining obesity or adiposity, it becomes important to have some measure of body fatness or leanness in addition to weight and height measurements. For this reason, in the Canadian weight-height survey, a skinfold measurement on the back of the upper arm was included in the data.

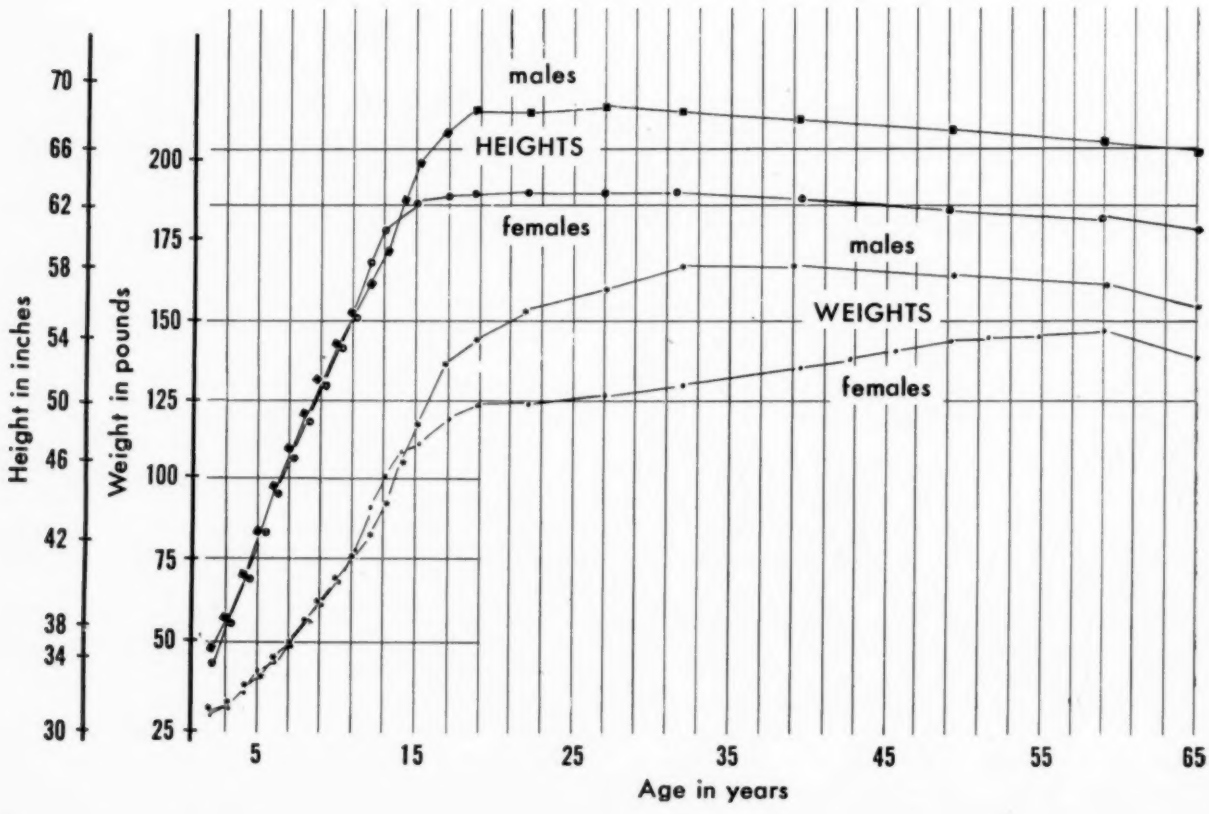
### *Height-Weight Increases*

The height-weight averages in the Canadian survey confirm the belief that in the last 30 years children have been taller and heavier at a given age than their parents were at the same age. However, only the rate at which height is reached has increased; adult weights have not changed a great deal.

Although weights and heights have shown a progressive increase during the past 30 years, the rate of increase has been slower in the last 14 years than in the preceding 16 years. The reasons for this slower rate of increase are not clear, Pett said, but he suggested that several factors may explain it. One of these may be more widespread nutrition education, with greater emphasis on the general effects of a balanced diet than on growth rates.

"I would like to believe that this factor is operating in this slowing down of the averages, because I believe it is the correct approach to a longer and fuller life," Pett stated.

**Canadian heights and weights for age.**



"Rapid growth may be one of the factors in our increase in degenerative diseases."

Average weight for adults drops at ages 45–54, climbs again, and then drops, the speaker concluded, and these changes may indicate some fundamental aspects that have not yet been studied. (See chart.)

## Explains Canadian Grants For X-ray Services

As one means of providing better diagnostic services in Canada, the Canadian Government in 1953 established a laboratory and radiological services grant, reported F. W. Jackson, M.D., director of health insurance studies, Department of National Health and Welfare, Ottawa.

The purpose of the grant is to assist the Provinces in providing laboratory and X-ray diagnostic services, purchasing equipment, training personnel, and conducting surveys and studies. The amount of the grant, to be matched by each Province, is 30 cents per capita the first year, increasing by 5 cents each year to a maximum of 50 cents per capita.

Jackson defined laboratory and X-ray diagnostic services as "those procedures which are ordinarily requested by a registered medical practitioner and performed by workers employed in institutions approved by the Provincial authority for the purpose of assisting the physician to diagnose the presence, absence, or status of disease, defect, or disability."

The grant will make more and better diagnostic services available throughout the Provinces, Jackson said, and will save time and money for the patients because the services will be available close to their homes.

### *Physician's Role*

Services financed by grant funds must be provided to the public at not more than cost, Jackson said. He stressed the fact that the traditional physician-patient relationship is to be maintained and said that there has been no thought of regimenting or centralizing personal health services. Rather, the objective is to strengthen the physician's hand and thus to bring greater and more direct assistance to the people themselves.

Jackson reported that the Manitoba Deputy Minister of Health had stated that in that Province the laboratory and radiological services grant had proved to be an inducement to the young and modern medical practitioner to practice in rural areas, had raised standards of service in rural hospitals, and had made the advantages of modern scientific diagnostic services accessible at reasonable cost.

## New Approach Might Aid English Problem Family

Recruitment of experienced area rehabilitation officers to supplement the practice of using health visitors and other academic social workers was strongly advocated by a British health officer as a possible way of coping with the problem of derelict families.

H. C. Maurice Williams, Dr.P.H., the medical officer of health for Southampton, England, said that despite the education, housing, and income available to the working class family today, England still has the problem of "submerged families." These families, with histories of ignorance, poverty, and vice, number an average 2.98 per 1,000 families.

"It is little wonder that when a family has to perform every function of life within the confines of a room 14 feet by 12 feet they degenerate," he remarked.

### *The Misfit Groups*

Socially misfit families can be broadly divided into three groups, according to Williams, even though there is no well-defined common yardstick of measurement.

One group shows affection for the children. These children are supplied with sufficient but unsuitable food. The mother has many pregnancies and is completely unable to cope with the routine work of domestic life. The father fails to encourage his wife. His laziness and long record of unemployment, Williams felt, does not disturb him so long as he can receive from public assistance arrangements almost as much money as he would if he went to work. If caught in the early stages of degeneration, this group is capable of rehabilitation, Williams stated.

The father and mother in the second group, although usually educated above their station, have a low moral sense and no concern for their children's welfare or their legitimacy. Living conditions are satisfactory for the third group, but these parents are the ones who subject their children to physical cruelty. Fortunately, they are in the minority.

"The only satisfactory method of dealing with so-called problem families is as a family unit," Williams stated. The area rehabilitation officers he recommends for preventing family deterioration would be men and women experienced in life, who would mix intimately with the people of a locality, visit the public houses, and while there, in conversation and gossip, ascertain the potential families who are rapidly going downhill. The health visitor should come into the picture when the family has been returned to some degree of normality and when they are receptive to advice and health education, he added.

### *Other Solutions*

Two other approaches of working with the problem family as a family unit were described by Williams. In Southampton, a few derelict families were selected to see whether the altering of their circumstances would help them change their standard of living. Constant visitation and advice, the promise or provision of rehousing, and help toward getting furniture have proved to be some excellent means of bringing about rehabilitation. Although this method

at first sight appears fairly costly, it is far cheaper than leaving the problem untackled, he commented.

The Mayflower Home operated by the Salvation Army in Plymouth, England, is a pioneer experiment. Commitment to the home is offered as an alternative to prison sentence. Mothers live there with their children and may be visited by their husbands. The prevailing assumption is that a wholesome, nourished body is more responsive to spiritual correction than an unclean and unfed one. The first lesson begins in the bathroom. Then the women are taught simple rules of housewifery and the importance of adhering to a methodical, daily routine. On completion of their daily tasks, they are free to visit the local cinemas and teashops.

The schools should pay more attention to the teaching of housewifery and domestic responsibilities, Williams believes. Children of problem families could be selected for additional instruction and the curriculum adjusted to this end.

## Infant Mortality Pattern Noted in English Study

A rise in postneonatal mortality with the mother's parity has been noted in a current study in England.

Reporting this and other studies of the social medicine research unit, Medical Research Council, London, was J. N. Morris, D.P.H., director of the unit.

This rise, Morris specified, occurs in each age group, but it is sharper among younger women. The trend is evident in the different social classes, indicating that it is not simply a matter of young mothers with large families being more common among the poorer classes, he added.

Analysis by cause of death shows that the pattern is accounted for by the deaths from "environmental" causes—infections and accidents, he stated.

This study, a joint inquiry with the General Register Office, is concerned with the 1½ million births in 1949 and 1950 in England and Wales and the 80 thousand stillbirths and infant deaths among them. It is mainly a theoretical exercise in social biology, Morris explained, but he said that immediately practical results may also emerge. For example, it may be of value in the identification of "vulnerable" groups requiring particular attention from public health services.

### *Duodenal Ulcer*

From a study of the family situation of 32 men aged 16 to 25 years who have duodenal ulcer, Morris reported the following: Mothers of these men tend to be dominant in the home; to have overprotected, overrestricted, and overindulged their sons; and to have an unusually great amount of psychosomatic disorder.

The objective of this study, he noted, is to try to identify patterns of family relations and of child upbringing which may be connected with the development of ulcer. In his opinion, one of the greatest needs in social-medical research today is to develop working partnerships with the social sciences and psychiatry.

Another study is trying to learn what is happening in the field of general practice. Essentially an essay in method, this study has found, Morris reported, that the general practitioner spends almost one-half his time dealing with serious, mostly chronic, disease. It has also found that about 13 percent of all their work is concerned with bronchitis, he said, a finding of interest in connection with the increased attention in the United Kingdom to respiratory disorders and atmospheric pollution.

## Outlines Control Measures For Australian Zoonoses

Hydatid disease, Q fever, brucellosis, leptospirosis, psittacosis, and arthropod-borne encephalitis are the important zoonoses in Australia. The fact that hydatid disease is still a problem—affecting 40 percent of farm and sheep station dogs—indicates its continued importance in public health, said A. R. Southwood, M.D., director general of public health for South Australia.

Southwood based his information on reports given to the 1953 Australasian Science Congress and on his observations as a member of the Australian National Health and Medical Research Council.

Effective cooperation of veterinarians, entomologists and other zoologists, epidemiologists, laboratory experts, and practicing physicians is necessary to prevent epizootics, he said. In the field of zoonoses, more than in any branch of medicine, it is necessary to study the ecology of the animal, the pathogen, the vector, and man, he continued.

### *Hydatidosis*

Wider use of educational methods was urged by Southwood for the control of hydatid disease rather than attempting to police laws, such as those restricting the number of dogs.

Hydatid disease is responsible for about 50 deaths a year among Australia's 8 million people, he stated. The amount of illness it causes is hard to estimate, but for a disease so easily controlled, any amount is too much, he noted.

The country has patterned its control program on Iceland's campaign of public education, better control of slaughtering, and veterinary inspection of all meat. Control measures also include the anthelmintic treatment of dogs once a year. Arecoline hydrobromide, properly used, clears dogs of infestation, but no drug treatment is effective against the hydatid cysts, Southwood said. Surgery may be resorted to when the disease occurs in humans.

### *Other Zoonoses*

In discussing control measures for the leading zoonoses, he said:

Many of the zoonoses have a typical occupational bias and are manifested in man by vague illnesses and little fevers, making accurate diagnosis difficult. Human sufferers respond well to some of the antibiotics. Q fever patients are effectively treated with chloramphenicol or aureomycin. In treating psittacosis, aureomycin or terramycin is preferred to penicillin, although large doses of penicillin are efficacious. Aureomycin arrests undulant fever attack, but relapses are common.

Q fever in man probably occurs more often by inhalation of dust from hides which carry dried feces of the infected cattle ticks than through skin contact with infected beef. Preventive measures include control of the common animal reservoirs, of air contamination, milk supplies, and of exposed individuals by means of protective clothing, respirators, immunization.

The spread of brucellosis would be stopped by the vaccination of all young cattle, sheep, goats, or swine, the elimination of all infected animals, and the pasteurization of all milk supplies.

Leptospirosis should be controlled by the destruction of rats; the elimination or treatment of infected pigs and dogs; the control of moist conditions favorable to leptospirae, including the proper drainage of canefields, cowyards, and piggeries. Since the organisms can survive in mud and water, people should wear protective clothing, such as waterproof boots, overalls, and gloves, and avoid swimming in infected water.

# Vision and Hearing Testing . . .

*How effective the Massachusetts vision test is in identifying school children who need visual care and how the test compares with one State's school vision screening procedure can be determined from the Danbury and Oregon studies. Also discussed is the first attempt at citywide testing of preschool youngsters for hearing.*

## Oregon Compares Snellen And Massachusetts Tests

Will the Massachusetts vision test disclose more or fewer vision defects than are found by the practice, current in Oregon, of having teachers give the standard Snellen test and report observed signs of poor vision?

If a trained test operator gives the Snellen test and makes similar observations, how will the defects found compare with those disclosed by the Massachusetts test?

Will the probable defects uncovered as a result of any one of these three procedures justify referral, in terms of correction or care recommended on professional eye examination?

These basic questions were posed as the objectives of a study of vision screening made in 1953–54 by the Oregon State Board of Health and reported by Eleanor B. Gutman, M.D., M.P.H., director of the board's vision conservation section.

Gutman pointed out that continued controversy over school vision screening stimulated comparison of Oregon procedure with the widely used Massachusetts test. For comparative purposes, both testing procedures were broken down into the referral standards of their separate component parts: The Snellen component of the Massachusetts test was compared with Snellen testing by the Oregon teachers and by trained test consultants. Conclusions drawn from the study were based on 3,775 Massachusetts tests, 3,104 reports of teacher findings, and 365 similar Snellen-observations made by an experienced operator testing the control group. Some of the findings were:

The Massachusetts test is an effective case-finding method, justifying 75 percent of its referrals. It disclosed more than twice as many probable defects of vision as were found on teacher screening. Its highest efficiency lies in the Snellen component, which yields 61 percent of all failures and is confirmed by professional examination in 84 percent of the cases referred. The plus lens and Maddox rod components are less selective, but provide a battery of tests whereby the more elusive visual defects may be brought to examination. Approximately 66 percent of these will require care in the combined judgment of physicians and optometrists.

The Snellen-observations made by the trained operator disclosed the same percentage (16.7) of probable defects among the children as did all parts of the Massachusetts test (16.6), indicating close correspondence in the case-finding potential of the two methods when given by experienced operators.

Screening by the Snellen test plus teacher observation is not to be disparaged as a case-finding method, but it has not reached its full potential in the Oregon schools. Only rarely were teacher observations recorded on the school health records so that the failures in the teacher-screened group were essentially Snellen test failures—thus, only comparable to failures to pass the Snellen component of the Massachusetts test.

Still to be investigated is how large a percentage of cases referred

for examination on observed signs and symptoms alone will warrant treatment for specific defects.

## Hearing of Preschoolers Tested in Buffalo

As a byproduct of summertime availability of 3 full-time audiometric technicians, a preschool hearing screening program was launched 4 years ago in Buffalo and rural Erie County, N. Y. Since then, 125 hearing clinics have been held in conjunction with topical fluoride clinics for preschoolers, at testing sessions in the schools on registration day, and at well-publicized special clinics.

In describing this first attempt at mass testing very young children with a pure tone audiometer, Buffalo's deputy health commissioner, William E. Mosher, M.D., M.P.H., and Adfur E. Maines, M.D., director, school health service, said delaying the initial screening of children until the second grade can no longer be justified.

The Buffalo school schedule now calls for testing youngsters on entering kindergarten or first grade. This procedure has the advantage of early detection of hearing impairment and outweighs the possible limitation of individual screening tests in the older age groups.

The techniques used in Buffalo have proved effective, practical, and relatively inexpensive, Mosher and Maines asserted. The only major expense has been the salaries of the trained technicians. In their hands, the tests can be performed with sufficient accuracy to isolate a significant percentage of hearing losses among the test group. Repeat threshold tests under ideal conditions at the Buffalo Speech and Hearing Center have compared very favorably with the results of the field tests.

If a daily clinic attendance of 35 children could be maintained, it should be possible to test about 1,200 children in a 7-week period, the health officials believe. This estimate takes into consideration the time devoted to the uncooperative child as well as the time-consuming threshold tests.

### *Screening Techniques*

More than 5,000 children, 90 percent of them under 6 years and some as young as 2, have so far been given the individual pure tone sweep test at speech range frequencies. Because of the high noise level in many of the testing rooms and the difficulty of getting young children to cooperate the 20-decibel hearing level was used. When a child failed to hear

# Recent Advances in Rabies Control

When two dogs attacked a group of children going home from school last June, some of the children were bitten severely on the head and neck. Others suffered minor cuts and bruises. One dog had to be shot through the head. The other was taken into custody.

This attack started an imaginary rabies outbreak in the Republic of Neutralia, an imaginary country. The topic opened a panel discussion on rabies control at the 1954 Conference of Public Health Veterinarians.

On the basis of this hypothetical situation, the members of the panel outlined a control program and described in detail the steps necessary for the diagnosis of rabies in a biting animal, such as a period of observation, laboratory examination of the head for Negri bodies, mouse inoculation test.

Attention then turned to control measures, of which the most important, they agreed, is the vaccination of at least 70 percent of the dog population.

Next, the problem of wildlife rabies was considered. The reduction of species known to be particularly likely to spread the disease, such as foxes, was recommended, and the need for further study of rabies in wild animals was emphasized. Rabies in bats, recently given much publicity, was described as deserving additional investigation.

The discussion concluded with a brief report of results in the treatment of humans with rabies antiserum and a preliminary statement about the use of chick embryo adapted live virus for the prophylactic vaccination of man.

Hilary Koprowski, M.D., was panel moderator. He is assistant director of viral and rickettsial research for Lederle Laboratories, Pearl River, N. Y. The speakers were:

Ernest S. Tierkel, D.V.M., director, rabies control activities, Public Health Service, Atlanta; Donald J. Dean, D.V.M., veterinary consultant, New York State Department of Health; Leland E. Starr, D.V.M., public health veterinarian, Georgia Department of Public Health.

Also: John P. Fox, M.D., professor of epidemiology, Tulane University School of Medicine, and T. F. Sellers, M.D., director, Georgia Health Department.

2 or more of the test frequencies in either 1 or both ears at that level, and this was confirmed by a full threshold acuity test, he was considered a verified hearing loss and referred to a family physician, private otologist, or to a hospital hearing clinic.

Sixty-three children (1.2 percent) were found to have a verified hearing loss. Medical and educational recommendations were made for 44 children; 2 were recommended for further observation; and 7 were reported to have normal findings. Conductive deafness was the diagnosis in 30 cases, and nerve deafness in 2. Other causes of hearing loss included allergy, wax, and foreign body in ear canal. The most common recommendation was removal of tonsils and adenoids. With the exception of 1 deaf mute, hearing loss was not suspected by the parents.

In 1954, an effort was made to recheck all children found to have a verified hearing loss during the earlier clinics. The majority were found still to have a significant impairment at the time of the recheck audiogram.

## Describes Danbury Study Of Massachusetts Test

How effective is the Massachusetts vision test in identifying the children whom opthalmologists and optometrists find to need visual care?

Like any other screening process, vision testing has inherent errors of under-referral and over-referral, said Hollis M. Leverett, vision consultant, American Optical Company, Southbridge, Mass.

Although it is expected that some children who need attention may not be identified by screening and that others who do not need care may be referred for professional examination, reasonable efforts should be made to minimize these errors, Leverett stated. In his opinion, the criteria for referral and the adequacy of testing in the schools are crucial factors.

Leverett, who guided the design of a new experimental model of the Massachusetts vision test, conducted the Danbury, Conn., school vision screening. This study is part of a broader program to evaluate the test and to improve the efficiency of the instrument and the test routine in the schools.

Each child was tested carefully. Those who failed were given a second opportunity to take the test. On the assumption that the children who could pass the second test would have constituted errors of over-referral, the retest procedure has obvious and crucial value, he remarked.

After describing standards for failure, which varied with the grade, procedures of referral for children not wearing glasses, and how recommendations were obtained from doctors for children wearing glasses, he summarized the results of the study:

For children tested through the glasses worn, it was found that 56 percent failed the first test and 45 percent failed both tests on retesting.

For children who did not have glasses, it was found that 20 percent failed the test and 12 percent failed both test and retest.

### *With or Without Glasses*

Leverett said that the evidence presented makes it clear that the test performance of school children is subject to considerable variation. Eleven percent of the children wearing glasses and 9 percent of the children who do not have glasses change performance from fail to pass on retest.

Test results for children wearing glasses and for children not wearing glasses indicated marked differences in performance, chiefly, in test failure rate, rate of change from fail to pass on retest, and variations of failure rate with grade. Because of these variations, he believes it undesirable to apply the usual testing and referral practices to both groups.

Despite improved vision made possible by lenses, a large proportion of children wearing glasses were unable to meet the screening test standards, he stated. About 45 percent failed both test and retest.

Leverett considered the failure rate for children wearing glasses not surprising. Some have deficiencies which cannot be corrected to the level of test requirements. Others have deficiencies such that correction to that level is not desirable.

Inquiries were made to determine the visual care status of the children who were wearing glasses, Leverett reported. The doctors' reports indicated that, following the inquiries, 88 percent of the group had been examined within a 2-year period. A reexamination was considered desirable for 43 percent. Only 29 percent arranged reexamination as a result of the inquiries made.

It was Leverett's impression that, with slight modification, the inquiry procedure could be made exceedingly effective in encouraging the desirable periodic examinations for children who are under professional care.

Leverett said that the children not wearing glasses who failed the test were referred for a complete visual examination. The doctors' reports on these referrals indicated that:

For 72 percent, visual care was needed and prescribed.

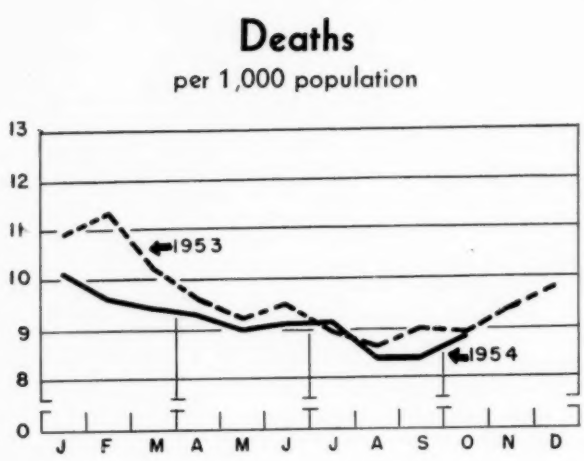
For 23 percent, professional attention was indicated although visual care was not prescribed.

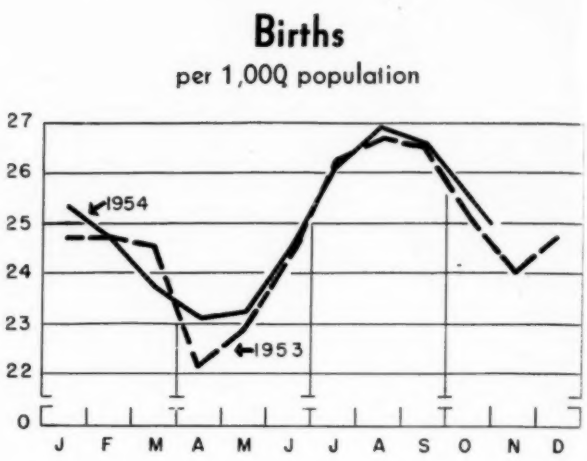
For 5 percent, no visual deficiency was identified.

Leverett noted that the criterion adopted to designate a "correct" referral would make a difference in the statistics.

If the immediate need for visual care were adopted as the criterion, 72 percent of the referrals were correct and 28 percent in error, he said.

But if the need for visual care or the doctor's opinion on the need for professional attention were the criterion adopted, 95 percent of the referrals were correct and only 5 percent in error, he said.




# United States Vital Statistics, 1953–54

A new high for births and a new low for deaths appear very likely for 1954. Thus, the natural increase in the population of the United States—that is, births minus deaths—should be greater than for any previous year. Marriages in 1954 continued the decline which has been almost continuous since 1946. Divorces, which decreased sharply in the early postwar years, appear to be leveling off. These statements are based on provisional figures for States shown in the *Monthly Vital Statistics Report* for January–October 1954. Each month the figures are sent by State and local officials to the National Office of Vital Statistics, where they are used to obtain United States estimates.

## Births

During the first 10 months of 1954, an estimated 3,344,000 births were registered, exceeding the number in these months of 1953 by 2.5 percent. If this lead is maintained for the rest of the year, about 4.0 million births will be registered, making 1954 the fourth successive record-breaking year. Including unregistered births, the total will be 4.1 million.

In each year since the end of World War II, births have been at a considerably higher level than during the war or the immediately preceding years. Rising sharply after demobilization, the birth total (adjusted for under-registration) climbed from 2,858,000 in 1945 to a peak of 3,817,000 in 1947. It dipped slightly in 1948 and leveled off during the next 2 years. In 1951 the number of births again increased, and continued to rise in 1952, 1953, and the first 10 months of 1954.

The birth rate per 1,000 population in 1953 was 25.1, and, according to present indications, will increase slightly—to 25.2—in 1954. The latter figure is the second highest in 28 years, and is only 5.3 percent below the postwar peak (26.6) in 1947. In 1940, by comparison, it was 19.4, and during the depression of the 1930's, it had dropped to 18.4.

Much of the increase in births in 1953 and 1954 can probably be attributed to a continuing rise in the number of third, fourth, and fifth children. Data on birth order for these years are not yet available, but it is not expected that they will show an increase in the number of first births because of falling marriage rates since 1951.

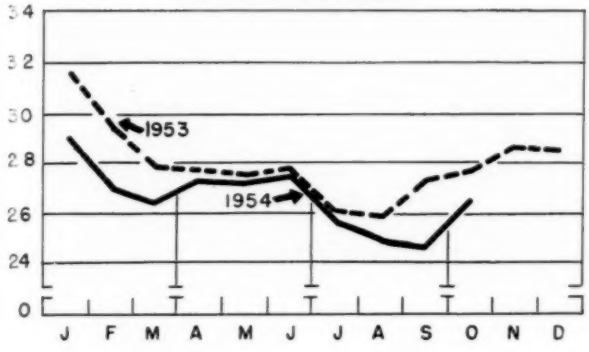
---

*Prepared by the National Office of Vital Statistics, Public Health Service.*

---

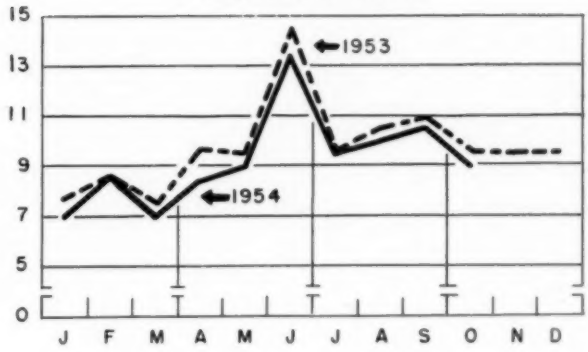
## Infant Deaths

per 1,000 live births




## Marriages

per 1,000 population




The seasonal variation in the birth rate during 1953 and in the first 10 months of 1954 was quite marked and closely resembled the pattern in previous postwar years. The rates for the first 3 months of 1953 formed a minor peak. This was followed by a sharp drop in April to the year's low of 22.0. In the next few months, the rate rose to a high of 26.7 (in August) before declining again. In past years, the birth rate has generally dropped at the end of the year. However, between November and December 1953, there was a rise of 2.5 percent. These measures are not adjusted for under-registration because of the negligible effect of this factor on changes from month to month.

### Deaths

During the past 5 years, 1949–53, the death rate has remained nearly stationary, varying only between 9.6 and 9.7 per 1,000 population. This pattern will be changed in 1954, judging from the unusually favorable mortality experience of the first 10 months. For the period January through October, the death rate (on an annual basis) was 9.1 for 1954, compared with the previous low of 9.6 recorded for 1950, 1951, 1952, and 1953. Unless mortality for the remaining 2 months should be unexpectedly high, the death rate for 1954 will be either 9.2 or 9.3.

The infant mortality rate (the number of deaths under 1 year per 1,000 live births) promises to be lower in 1954 than the year before, continuing the general downward trend. This rate for January–October was 26.6 in 1954, compared with the previous low of 27.9 in 1953.

The outstanding feature of the year 1954 was the absence of any reported outbreak of influenza. In each of the previous 4 years, there was an outbreak of influenza in the early part of the year. The most severe was in January and February of 1953, and the accompanying chart shows the very large number of deaths resulting from the widespread occurrence of influenza and other acute respiratory infections. The year 1954 was the first since 1949 in which no outbreak occurred, and as a consequence the death rates for the chronic cardiovascular diseases, as well as for influenza and pneumonia, have been relatively low.

### Marriages

During the first 10 months of 1954, fewer marriages were reported than in the same period of 1953, and the marriage rate declined from 9.7 to 9.2 per 1,000 population. In previous years, the estimated marriage rates for the January–October period, based on provisional figures, have not varied greatly from the rates for the entire year, based on final returns.

The decline in marriages may in part be attributed to the low birth rates of the 1930 decade, with the result that there are fewer young people of marriageable age in the present decade.

Monthly estimates of marriages in the United States are based on figures on marriage licenses, intentions of marriage, and marriages by reporting month, available from the individual

## Vital statistics: United States, 1952, 1953, and January–October 1954

| Item | January–October | | | January–December | | |
|---|---|---|---|---|---|---|
| | 1954 | 1953 | Percent change | 1953 | 1952 | Percent change |
| | Number | | | | | |
| Live births: | | | | | | |
| Registered | 3,344,000 | 3,262,000 | +2.5 | 3,909,000 | [1] 3,846,986 | +1.6 |
| Adjusted for under-registration | 3,389,000 | 3,314,000 | +2.3 | 3,971,000 | [1] 3,913,000 | +1.5 |
| Marriages | 1,227,000 | 1,282,000 | −4.3 | 1,533,000 | 1,539,318 | −.4 |
| Deaths | 1,221,000 | 1,263,000 | −3.3 | 1,519,000 | 1,496,838 | +1.5 |
| Infant deaths | 88,400 | 90,500 | −2.3 | 109,100 | 109,413 | −.3 |
| | Rate | | | | | |
| Live births: | | | | | | |
| Registered | 25.0 | 24.8 | +0.8 | 24.7 | [1] 24.7 | 0 |
| Adjusted for under-registration | 25.3 | 25.2 | +.4 | 25.1 | [1] 25.1 | 0 |
| Marriages | 9.2 | 9.7 | −5.2 | 9.7 | 9.9 | −2.0 |
| Deaths | 9.1 | 9.6 | −5.2 | 9.6 | 9.6 | 0 |
| Infant deaths | 26.6 | 27.9 | −4.7 | 28.0 | 28.5 | −1.8 |

[1] Based on a 50-percent sample.

NOTE: Deaths are exclusive of fetal deaths and of deaths among armed forces overseas. Data are final for 1952, and are estimated for 1953 and 1954. Birth, death, and marriage rates are per 1,000 population excluding armed forces overseas; infant mortality rates are per 1,000 live births and are adjusted for the changing numbers of births. All rates are on an annual basis. Population figures were furnished by the Bureau of the Census.

States. The estimating procedure is described in the January 1954 issue (vol. 3, No. 1) of the *Monthly Vital Statistics Report.*

### Divorces

Figures on divorces available on a current basis from 25 areas show that the numbers of divorces in the first 9 months of 1954 are lagging about 4 percent behind comparable totals for 1953. For 21 areas, the 1953 total was almost identical with that for 1952. During 1952, the estimated number of divorces and annulments in the United States was 392,000, and the rate was 2.5. This is in marked contrast to 1946, when divorces were estimated at 610,000 with a rate of 4.3 divorces per 1,000 persons, the largest number and rate for any year on record.

# Physical Activity And Arteriosclerotic Heart Disease

*Statistical studies are needed to investigate the possibility, suggested by mortality figures for various occupations in England and Wales, that physical activity tends to protect the middle-aged from acute coronary occlusion.*

By Percy Stocks, M.D., D.P.H.

A POSSIBLE association between locomotory habits and arteriosclerotic heart disease has been suggested by results of studies of death rates in recent years, according to occupation, for coronary disease and for myocardial disease. Also, a rise in death rates for arteriosclerotic heart disease has accompanied an increasing use of the motorcar and has been noted particularly among those classes of men who use motorcars most and tend to walk least. I would suggest that statistical studies be planned in several countries aimed at obtaining more evidence to prove or disprove the hypothesis that lack of exercise may encourage the onset of coronary occlusion.

Recent research suggests that lipoid metabolism may be concerned in the etiology of atheroma. However, when atheroma is lethal it is usually because occlusion supervenes—and the determining factors for occlusion may have little to do with diet. It is not unreasonable to suppose that when the coronary arteries are atheromatous, it is the mechanics of the circulation rather than the chemistry of the blood which decides whether obstruction occurs in a large branch with resulting coronary crisis or in peripheral branches with more gradual myocardial degeneration as the outcome.

It has been observed that among men whose social conditions were most favorable, degenerative heart disease tended to express itself as coronary disease or angina pectoris, whereas at the other end of the social scale, where occupations involving hard physical work predominated, heart disease tended to take forms described on death certificates as myocardial degeneration (*1*). In 1951 I pointed out (*2*) that, although one-seventh of the 4,000 deaths attributed to coronary and myocardial diseases among navvies, coal hewers, dock laborers, and agricultural laborers were certified as due to coronary disease or a synonym of it, that proportion became greater with decreasing physical activity in the occupation. For example, the proportion of coronary to total myocardial and coronary disease was about one-quarter for metal machinists, printers, retail salesmen, sorters, and farmers, and nearly two-fifths for teachers, clerks, bankers, and administrative officials.

Morris and his associates (*3*) have now followed this up with a more detailed statistical study of the deaths in 1930–32 among 2½ million men aged 45–64 in social classes III to V, which comprise the skilled artisans, partly skilled workers, and unskilled workers. The occupations were classified into three groups, designated as physicially heavy, physically light, and intermediate or doubtful jobs

*Dr. Stocks is a senior research fellow with the British Empire Cancer Campaign. From 1933 through 1950, he was chief medical statistician, General Register Office, London, and in the years 1947–51 he served with the World Health Organization in the preparation of its Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death.*

*This paper was presented before a session on arteriosclerosis and cardiac diseases at the International Congress of Clinical Pathology in Washington, D. C., September 7, 1954.*

within each social class. At each age period, 45–54 and 55–64, the coronary disease death rate was about twice as great for persons in physically light occupations as for those in the heavy occupations. For death rates from valvular, myocardial, and cerebral vascular lesions and arteriosclerosis without heart affection, no differences of importance were found between the physical activity groups. The same investigators also found from a careful study of early mortality rates from coronary disease during 1949–52 among bus conductors, bus drivers, postmen, and telephone operators working in the same areas of London that the death rate was lower among conductors than among drivers and lower among postmen than among telephonists. All this lent support to the hypothesis that in middle age physical activity tends in some way to protect the individual against coronary occlusion in an acute form.

### Deaths Among Amputees

In 1951, an Advisory Committee on Cardiovascular Disorders and Mortality Rates in Amputees, appointed by the Ministry of Pensions in London, prepared an interim report on a statistical analysis of the subsequent histories of men who had lost one or more limbs in World War I.

In that study, for the 5 years 1945–49, the causes of death of a representative sample of more than a thousand men who had suffered a single lower limb amputation during World War I were compared with a control group of corresponding age distribution who had suffered from wounds without an amputation. The deaths attributed to coronary and myocardial disease combined formed practically the same percentage of all deaths in the two groups, but the ratio of coronary disease to myocardial disease within the combined total was higher among the amputees than among the controls. Although this was not generally accepted by the committee as having any significance, my personal opinion, expressed in an appendix to the report, was that there was probably a connection between these ratios and the restricted physical activity of amputees. The recent work of Morris and his co-workers (*3*) has not caused me to change that opinion.

It has been suggested that the long-continued physical and emotional stresses and privations such as were experienced in the First World War both by men in the services and by civilians might have been a factor in the subsequent increase in coronary disease mortality; but such an idea is not incompatible with a favorable effect of regular physical exercise which involves no nervous stress.

### Deaths Among Athletes

A recent paper by Rook (*4*) gives the result of comparing the mortality experience of 772 Cambridge University students who had taken an active part in sports while at the university with that of 710 men who had not done so. No evidence emerged that the sportsmen died at an earlier age than the control group; in fact, if allowance is made for their rather higher proportion of deaths from violent causes, the reverse must have been the case with respect to death from natural causes. Out of 387 deaths from nonviolent causes at ages under 65, when the certified cause of death was known, 9.3 percent of the sportsmen were said to have died of a cardiovascular condition compared with 12.1 percent of 289 in the control group. Because many of the deaths occurred before 1920, no more precise division of the heart conditions could be made; but at least this finding is not incompatible with the hypothesis.

#### REFERENCES


(*1*) Great Britain. Registrar General: Decennial supplement, England and Wales, 1931. Part 2A. Occupational mortality. London, His Majesty's Stationery Office, 1938.

(*2*) Stocks, P.: Coronary disease and modern stress (letter to editor). Lancet 260: 351, Feb. 10, 1951.

(*3*) Morris, J. N., Heady, J. A., Raffle, P. A., Roberts, C. G., and Parks, J. W.: Coronary heart-disease and physical activity of work. Lancet 265: 1053–1057; 1111–1120, Nov. 14 and 15, 1953.

(*4*) Rook, Sir Alan: An investigation into the longevity of Cambridge sportsmen. Brit. Med. J. No. 4865: 773–777 (1954).